

Running head: PRE-DRAWN/CONSTRUCTED/UNSTRUCTURED MANDALAS 1

Pre-Drawn Mandalas versus Constructed Mandalas versus Unstructured Mandalas:

Which Creates a Greater Reduction in Anxiety?

A THESIS

Submitted by

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**Pre-Drawn Mandalas versus Constructed Mandalas versus Unstructured  
Mandalas: Which Creates a Greater Reduction in Anxiety?**

**Abstract**

This study specifically tested whether a pre-drawn mandala shape, a constructed mandala shape-"Zendala"®, or an unstructured mandala circle shape had a greater reduction in anxiety levels of college students when the students were exposed to anxiety through a four-minute writing exercise. This study addressed the question: "Which creates a greater reduction in anxiety using the *State Anxiety Inventory*: pre-drawn mandalas, constructed mandalas, or unstructured mandalas?" The data was collected from a series of participant groups, with a maximum group size of 21 adults, using a randomized, pre-test and post-test design with the *State Anxiety Inventory* (SAI) instrument as the measure of the study's results. The 42 participants, in three groups, had their anxiety measured with the SAI three times: baseline anxiety- Time 1 (T1), after a four-minute writing exercise- Time 2 (T2), and after the randomized intervention-either a pre-drawn, constructed, or unstructured mandala- Time 3 (T3). The writing exercise (T1-T2) produced statistically significant results for the pre-drawn and unstructured groups, but not the "Zendala"® group. Pre-drawn, unstructured, and "Zendala"® mandalas were all found to be equally statistically ineffective at reducing anxiety from T2 to T3 when compared to each other. Yet, the pre-drawn and the unstructured mandala groups' paired sample *t*-tests support that as interventions there is promise that they can successfully reduce anxiety from T2 to T3.

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## **Chapter One: Introduction**

### **Introduction to the Study**

The purpose of this study was to further the research of Curry and Kasser's (2005) and van der Vennet and Serice's (2012) studies on the effect mandalas have on anxiety levels to increase reliability and validity of their work and to research the effects constructed mandalas have on the anxious mood using the Zentangle® technique (Thomas & Roberts, 2012). This study was not a direct replication study but a continuation of Curry and Kasser's (2005) and van der Vennet and Serice's (2012) work by largely following key elements of their research design. This research study also addressed some of the considerations for further research brought forward by Curry and Kasser (2005) and van der Vennet and Serice (2012) and a question raised by Henderson, Rosen, and Mascaro (2007) in order to potentially further the understanding of mandalas for use in anxiety reduction within an art therapy framework.

Curry and Kasser (2005) had an interest in learning if geometric patterns were necessary to create anxiety reduction or if other structured figures, such as simple designs, would yield similar results. They also felt that if participants created their own mandala this would mirror conditions more typical of an art therapy intervention (Curry & Kasser, 2005). This study addressed these by introducing a different kind of mandala, a constructed mandala, that used a series of simple patterns from the Zentangle® technique (Thomas & Roberts, 2012). A constructed mandala contains the necessary structure, lack of geometrically perfect designs (this study's interpretation of "simple designs"), and the participant creation element necessary to test Curry and Kasser's (2005) suggestions for future applications.

Van der Vennet and Serice's (2012) replication study of Curry and Kasser's (2005), coupled with other recent studies, work effectively extinguished the option of using free form mandalas in this study due to their suggestion that a lack of direction and structure was responsible for the free form's inability to achieve anxiety reduction results comparable to their tested pre-drawn and plaid groups (Henderson et al., 2007). Van der Vennet and Serice (2012) also concluded that the mandala design was superior to the plaid design in anxiety reduction, expanding upon Slegelis's 1987 study on the mandala shape being superior to a square shape in anxiety reduction. The current study used the mandala shape due to van der Vennet and Serice's (2012) results and establishes a structure-based hierarchy of mandala types to test in terms of anxiety reduction: pre-drawn (highest amount of structure), constructed (mid-range structure), and unstructured (lowest amount of structure).

Curry and Kasser (2005), Henderson et al. (2007), and van der Vennet and Serice (2012) were all testing various varieties of mandala forms' anxiety reducing capacity in terms of use in a therapeutic environment, in specific to the art therapy field. Henderson et al. (2007) specifically questioned what the cause of the anxiety reduction was within the mandala intervention. Henderson et al. (2007) insinuated that art therapy itself may have been the reason for the mandala forms reducing participants' anxiety levels. As previously stated above, the constructed mandala most closely resembles an art therapy intervention through the construction process but does not deviate from the mandala's potentially meditative properties alone.

### **Personal Statement**

This researcher had an interest in improving the reliability and validity of art therapy assessments. Although this study did not directly address assessments, the researcher's study aspired to be able to bolster the reliability and validity of Curry and Kasser's (2005) and van der Venet and Serice's (2012) work on mandalas, which subsequently is a precursor to the creation of an assessment. Therefore, the researcher hopes that with further study, mandalas can be used eventually as an art therapy assessment that has been proven to be valid and with a high rate of reliability. This study hoped to also contribute towards this cause by testing different mandala formats not previously tested: constructed and unstructured versus the more established and studied pre-drawn mandala pattern.

### **Research Question**

This study addressed the question: "Which creates a greater reduction in anxiety using the *State Anxiety Inventory*: pre-drawn mandalas, constructed mandalas, or unstructured mandalas?" The research hypotheses were that both the pre-drawn mandalas and unstructured mandalas would yield statistically similar ( $p < .05$ ) results in anxiety reduction from T2-T3 ( $H_{a1}$ ) and both would have a greater anxiety reduction from T2-T3 than the "Zendala"® ( $H_{a2}$ ). The "Zendala"® required more extensive instruction, and the directions could not be inferred non-verbally. The greater amount of effort expelled to complete the "Zendala"® may negate the stress-reducing qualities of "Zendalas"®. Zendalas® are normally completed by persons that were previously instructed in the Zentangle® method by a Certified Zentangle® Teacher (CZT).

### **Participants in the Study**

This study had a total of 42 participants. The participants were students, undergraduate or graduate, from a college in the northeast quadrant of the United States. Seventy-one point four percent of the participants were between the ages of 18-25, and the age range was 18-48. Eighty-three point three percent of participants were female. A majority of students identified as either Social Workers (26.2%) or Art Therapists (26.2%), followed Music Therapy (14.3%), and Creative Arts Therapy (14.3%). The study's participants identified as either Caucasian (71.4%), African American (9.5%), Hispanic (9.5%), Asian American (4.8%), First Nation/Native American (2.4%), or Bi-Racial (2.4%).

The students were excluded from this study if they were not the age of majority: over age 18, but less than age 65. There were no exclusions based on race, religion, socio-economic status, sex, sexual orientation, gender expression, or immigration status. Participants volunteered their time and were able to leave at any time. Participants must have completed all parts of the study for inclusion in the data results. The exclusion criteria led one participant to be excluded.

### **Significance of the Study**

As previously mentioned, this study was examining mandalas within the context of its use in being able to reduce anxiety as an intervention in art therapy. Despite recent studies within the past decade (Curry & Kasser, 2005; Henderson et al., 2007; Sandmire, Gorham, Rankin, & Grimm, 2012; Small, 2006; van der Venet & Serice, 2012), there remains a general lack of empirical research done on the use of mandalas as a therapeutic intervention in art therapy. This study hoped to add validity and reliability to the work completed by previous studies in the past decade, namely Curry and Kasser (2005) and

van der Vennet and Serice's (2012) replication study, by following the procedure and methodology sections outlined by each to within the practical limits of this study's design. This study also hoped to take Curry and Kasser's (2005) and van der Vennet and Serice's (2012) studies to a new "level" by testing different types of mandalas against the more empirically established pre-drawn mandala. The mandala forms explored here helped to further establish that there are limited types of mandalas that are useful in anxiety reduction.

The prevalence of anxiety disorders cannot be understated as it is one of the most common mental disorders in the United States (Sandmire et al., 2012; van der Vennet & Serice, 2012). As of 2010, 18.1% of adults in the United States were sufferers from one of six identified anxiety disorders in the *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition, Text Revision*; specific to this study's population, 75% of those identified adults experienced their first symptoms of anxiety by the age of 22 (Sandmire et al., 2012). Anxiety is long-lasting and debilitating; therefore any tool that can be used to assist in prevention and/or management of the symptoms of anxiety would be beneficial (van der Vennet & Serice, 2012). As Curry and Kasser (2005), Henderson et al. (2007), Sandmire et al. (2012), Small (2006), and van der Vennet and Serice (2012) have previously advocated, mandalas and their meditative properties coupled with art therapy (found to be an effective treatment modality for anxiety disorders) can magnify the beneficial effects of mandalas and art therapy. By these factors alone, there is still a rationale for further exploration of mandalas and their applicability in the art therapy field in being able to assist with persons suffering from anxiety. The combined efforts of studies on this topic may also eventually produce a reliable and valid assessment tool for anxiety/anxiety reduction using mandalas to further assist art therapy clients.



### Definition of Terms

The following terms are vital in understanding key concepts of this study:

*Anxiety*- A series of physical and emotional responses our bodies go through in an attempt to cope when the stressor or origin is unknown (Chambala, 2008).

Anxiety is generally considered long term, meaning that the symptoms continue even when the stressor/origin is found and removed (Oman et al., 2008; van der Vennet & Serice, 2012).

*Types of Anxiety:*

- a) *State Anxiety*- A category of anxiety measurement developed by Spielberger (1966) for his State Trait Anxiety Inventory that measures a person's current transitory levels of anxiety (Sandmire et al., 2012).
- b) *Trait Anxiety*- A category of anxiety measurement developed by Spielberger (1966) for his *State Trait Anxiety Inventory* that measures a person's levels of long-term proclivity towards anxiety (Sandmire et al., 2012).

*Mandala*- A type of art form contained in a circular format that serves as a mechanism for therapeutic outcomes (Henderson et al., 2007).

*Types of Mandalas:*

- a) *Constructed Mandala*- A blank mandala shape that has accompanied technique-specific instructions to guide the creation of the mandala at each step of the process (Small, 2006). This study's constructed mandala used a three-part series of simple designs, called tangles®, from the Zentangle® technique to guide the creation process, and the constructed

mandala is considered to be more structured than the unstructured mandala but less structured than the pre-drawn mandala.

- b) *Free Form Mandala*- Most commonly a free form mandala is either a completely blank piece of paper or a piece of paper with a blank circle shape from which a person is expected to create a mandala (Curry & Kasser, 2005; Henderson et al., 2007). Poignant to this study, a free form mandala is defined as a mandala that lacks accompanied written/verbal instruction, regardless of format, and represents the least structured of all mandalas mentioned in this study.
- c) *Pre-Drawn Mandala*- This type of mandala is the most structured of the mandala varieties explored in this study due to its structured, complex, and complete geometric pattern enclosed inside the circle shape (Curry & Kasser, 2005; Small, 2006; van der Venet & Serice, 2012). The instructions for this type of mandala are implied through the completeness of the geometric pattern; however, this study added additional instructions for further structure. Pre-drawn mandalas are most commonly studied type of mandala in recent literature and in relation to mandala's use in art therapy (Curry & Kasser, 2005; Small, 2006; Henderson et al., 2007; van der Venet & Serice, 2012).
- d) *Unstructured Mandala*- A phrase used for the purposes of this study to describe a blank mandala shape (a circle) with accompanied instructions for creating a mandala. The unstructured mandala is considered less structured than the constructed mandala but more structured than the free form mandala.

*Meditation*: "...the process of calmly limiting attention and/or thought using a series of mental exercises" (Curry & Kasser, 2005, p. 81). These practices are thought to help self-regulate the body and mind, specifically mental health issues due to their cognitive nature (Cahn & Polich, 2006; Rausch, Gramling, & Auerbach, 2006).

- a) *Mindfulness Meditation*- A sub-type of meditation that is cognitively based that promotes living life in the present, a non-judgmental awareness of self, stress and anxiety relief, and/or being able to be aware of, and maintain, mental contact with positive emotions (Erisman & Roemer, 2012; Oman, Shapiro, Thoresen, Plante, & Flinders, 2008).

*Stress*- A series of physical and emotional responses our bodies go through in an attempt to cope with the emotion of fear when exposed to a stressor- a concrete life event with negative connotations that activates the emotional response of fear (Schrade, Tronsky, & Kaiser, 2011). Stress is defined as short term, meaning that the symptoms alleviate once the stressor is removed (Schrade et al., 2011).

*"Zendala"*®- A phrase used for the purposes of this study to mean a fusion of Zentangle's® tangles® and string® concepts with a mandala. This study's "Zendalas"® used the circle shape of the mandala, a string® to divide the "Zendala"® into sections, and Zentangle® tangles® to fill the mandala circle shape. Zendala® is a product of Thomas and Roberts (2012), but they do not list an official definition on their website at this time. Quotation marks are used to differentiate this study's working definition of a "Zendala"® versus the intended definition of Thomas and Robert's product.

*Zentangle*®- Thomas and Roberts's (2012) website describes a Zentangle® as a drawing technique that utilizes a variety of structured abstract patterns.

Zentangles® are thought to be meditative in nature, hence the word Zen's inclusion in the name (Thomas & Roberts, 2012). Zentangle's® difference from a structured doodle is in the meditative purpose behind a Zentangle's® creation (Thomas & Roberts, 2012).

*Zentangle*® Terms:

- a) *String*®: A random line created on an official Zentangle® tile or in a mandala shape to provide a framework in which to create the Zentangle's® tangles® (Thomas & Roberts, 2012).
- b) *Tangle*®: A variety of structured abstract patterns created by Thomas and Roberts (2012) that are used to fill the sections of the Zentangle® string®. A tangle® differs from a doodle in that the purpose of "tangling" (the verb form of creating a tangle®) is meditative in nature (Thomas & Roberts, 2012).

### **Assumptions**

Assumptions made in this research study were that the researcher was able to find participants for the study, and the study's results, based on said participants, could further the field of art therapy research on the topic of mandalas and anxiety. Due to previous research on the topic of mandalas and anxiety and the definition of terms section, the researcher assumed that the study's variables were clearly defined and able to be accurately measured using the given instrument: *State Anxiety Inventory* (Curry & Kasser, 2005; Spielberger, 1977; van der Venet & Serice, 2012). There were no

assumptions made on the potential healing qualities of “Zendalas”® since no formal studies exist on “Zendalas”® at this time.

### **Organization of the Study**

The research methodology for this study was an experimental quantitative research design inspired by Curry and Kasser’s (2005) and van der Venet and Serice’s (2012) research protocols. This study specifically tested whether a pre-drawn mandala shape, a constructed mandala shape-“Zendala”®, or an unstructured mandala circle shape had a greater reduction in anxiety levels of college students (graduate and undergraduate) when students were exposed to anxiety through a four-minute writing exercise. The data was collected from a series of participant groups, with a maximum group size of 21 adults, using a randomized, pre-test and post-test design using the *State Anxiety Inventory* (SAI) instrument to measure the participant’s state anxiety levels, thereby producing this study’s results. This collected data consisted of the participants’ consent form (Appendix B), art therapy confidentiality form (Appendix C), demographic form (Appendix D), and three testings of the *State Anxiety Inventory*-T1, T2, and T3. The results of this study were analyzed using a statistical analysis software application through the use of ANOVA analyses, paired sample *t* tests, means, and standard deviations.

### **Finances**

The researcher was funded by the *van der Venet Research Scholarship*.

## **Chapter Two: Literature Review**

### **Research Overview**

At first glance the humble circle shape seems an unlikely candidate as a tool for use in therapy. Prior research has attested that a particular form of circle known as a mandala is useful in reducing anxiety (Curry & Kasser, 2005; Henderson et al., 2007; van der Vennet & Serice, 2012). The methodology of this study was tweaked slightly from, and inspired by, Curry and Kasser's (2005) and van der Vennet and Serice's (2012) studies on mandalas and anxiety reduction. This study hoped to address some of the further study suggestions outlined by Curry and Kasser (2005) and van der Vennet and Serice (2012), such as: "Does the type of geometric design used for coloring affect the results?" and "Does the use of pre-drawn mandalas versus another format of mandala produce different results?" This study also hoped to address Henderson et al.'s (2007) observation about Curry and Kasser's (2005) study, "Although (Curry and Kasser (2005)'s) results show potential...the results could be interpreted in various ways, such as the calming effects of art therapy in general versus the effects of actually creating a mandala" (p. 149).

### **Types of Mandalas**

This study looked at several sub-types of mandalas. The most commonly studied form of the mandala is pre-drawn, the most controlled form of mandala, as it is already constructed for the person to color in. "Research has shown reducing anxiety through art therapy is most effective when controlled methods are employed" (Small, 2006, p. 16) can be thought of as a bedrock for the basis of pre-drawn mandala studies. The constructed mandala has so far been only used by Henderson et al. (2007) and Kellogg, Mac Rae, Bonny, and di Leo (1977). The constructed mandala can be thought of as

providing some structure by providing specific directions for creating the mandala.

Curry and Kasser (2005) suggested that having someone prepare their own mandala(s) is more synonymous with an art therapy intervention, the therapy of focus for this study.

Free form mandalas are the least structured and controlled. Free form can take the form of a blank piece of paper or a blank sheet with a circle shape (Curry & Kasser, 2005).

This study used an unstructured mandala- providing the person with a circle shape and open directions, meaning that they can create whatever they wish on the page.

### **History of Mandalas**

The translation of the word mandala ( मण्डल ) from its Sanskrit origins is commonly translated to the English word circle or disk, but “magic circle” is a more specific translation of mandala, hinting at its religious/spiritual origins (Miller, 2005; Youth for a New World, 2010). The basic physical shape of a mandala is a blank circle (Fontana, 2006; Miller, 2005). A human-made mandala is a created artwork within the circle shape and can be produced in any art form/medium of choice (Henderson et al., 2007; Pisarik & Larson, 2011). These human-made mandalas have been used for religious/spiritual purposes for centuries as well as more recently in the fields of psychology and the related psychological field of art therapy (Henderson et al., 2007; Miller, 2005). Mandalas have been used for psychological healing and integration in numerous applications and studies (Henderson et al., 2007). The mandala also has similar uses, healing and integration, when used in religion/spirituality (Youth for a New World, 2010). The specific type of mandala used for the purposes of this study can be represented by the Sanskrit word “yantra” ( यन्त्र ) - a purely geometrical mandala (Fontana, 2006). This type of mandala has been used in all the recent studies on

mandalas (Curry & Kasser, 2005; Henderson et al., 2007; Kellogg et al., 1977; Sandmire et al., 2012; Small, 2006; van der Venet & Serice, 2012).

## **Psychological**

### **Carl Jung.**

The use of the mandala as a therapeutic tool/technique in psychotherapy was first adopted by Carl Jung, a widely known psychologist who founded Analytical Psychology and was considered an early Transpersonal Psychologist (Miller, 2005; Schrade et al., 2011). Jung was famous, in part, for his studies of archetypes and the collective unconsciousness. Jung saw mandalas in all of nature, and they were spontaneously created by people, furthering his theories of the collective unconscious and archetypes (Hagood, 1985). It was of no surprise that Jung saw the mandala's function as a, "...symbolic representation of emotionally laden and conflicting material, yet at the same time [the mandala] provides a sense of order and integration..." (Henderson et al., 2007, p. 149). The blank circular shape of the mandala represented to Jung the wholeness and unity of the archetypal Self inside us all (van der Venet & Serice, 2012). Jung believed that mandala creation promoted psychological health through calming the mind and body, centering (becoming fully present to your experience of self in the moment), and being able to silence a person's inner chaos, a trait associated with anxiety (Curry & Kasser, 2005; Hagood, M., 1985; Henderson et al., 2007; Schrade et al., 2011; van der Venet & Serice, 2012).

### **Joan Kellogg.**

Art therapists have used mandalas as a basic tool in therapy with clients since Joan Kellogg's work on mandalas in 1969 (Henderson et al., 2007; Kellogg et al., 1977). Although Kellogg was most likely not the first art therapist to use mandalas in session,



arguably she was amongst the first to use mandalas broadly, to use mandalas is research, and the first to create an assessment based on mandalas- the Mandala Assessment Research Instrument (MARI)® (Kellogg et al., 1977). Kellogg came to use mandalas in her practice after being inspired by Jung's work on mandalas (MARI® Creative Resources Inc., 2010). By the late 1970's Kellogg was using mandalas as a therapeutic intervention at Johns Hopkins Hospital and had developed her assessment, currently the only formal mandala-based assessment available in the field of art therapy (MARI® Creative Resources Inc., 2010).

### **Late 1990's to Present.**

Since the work of Jung and Kellogg, mandalas have continued to be used in art therapy settings to promote healing, decrease symptoms of anxiety and stress, and reduce symptoms of post-traumatic stress disorder (Henderson et al., 2007). Mandalas were used in studies conducted in the 1990's for a variety of qualitative research studies (Henderson et al., 2007). The results of those studies argued for the use of mandalas in therapy sessions with clients with a wide array of major psychiatric disorders due to the positive gains noted in the studies' clientele (Henderson et al., 2007). Despite the qualitative research, mandala usage as a therapeutic tool remains limited due to lack of quantitative/empirical research and larger sample size research studies (Henderson et al., 2007). Although a large sample size is not feasible for this study, there are some types of mandalas that have not been studied at all and would still benefit from a smaller sample size study to test claims and/or hypotheses made about them, namely "Zendalas"®, constructed mandalas, and unstructured mandalas.

### **History of Zentangle®**

Zentangle® is the creation of Maria Thomas and Rick Roberts (Thomas & Roberts, 2012). A Zentangle® is a combination of the words Zen (implying it is meditative) and tangle®, a constructed phrase by Maria Thomas and Rick Roberts (Thomas & Roberts, 2012). The tangles® are the patterns that were created by Maria Thomas and Rick Roberts for the express purposes of the Zentangle® technique. They developed the Zentangle® method to be simple, meditative, and relaxing due to the easy-to-learn format of the Zentangle® technique. Creating a Zentangle® may also increase focus, creativity, provide artistic satisfaction, and an increased sense of personal well-being (Thomas & Roberts, 2012).

### **History of “Zendalas”®**

“Zendalas”® are a relatively new application of the Zentangle® method (Thomas & Roberts, 2012). “Zendalas”® were first mentioned in Maria Thomas’s blog entry on March of 2012 (Thomas & Roberts, 2012). The “Zendala”® art form is a combination of a round mandala shape and the Zentangle’s® string® and tangles® concepts (Thomas & Roberts, 2012). “Zendalas”® are thought to combine the meditative properties of the Zentangle® with the meditative properties of mandalas; within the realm of art therapy, a mandala is equivalent to any art form that is created inside a circle shape, so a “Zendala”® may indeed share the beneficial properties of mandalas (Henderson et al., 2007; Thomas & Roberts, 2012). There is currently no research on “Zendalas”®. This study was the first to study and test “Zendalas”®.

### **“Zendala’s”® Potential Application to Mental Health**

Implied through the information provided on mandalas, “Zendalas”® share similar qualities to Curry and Kasser’s (2005) plaid and pre-structured mandala in that

“Zendalas”® are all complex enough to require a certain amount of attention to complete, and Zentangles® (and therefore “Zendalas”®) have been thought to also be equally simple enough that creating one does not require excessive thought or focus to complete (Curry & Kasser, 2005; Thomas & Roberts, 2012). Additionally, the directions for the “Zendala’s”® tangles® provide the structure and literal/figurative direction that help to quell a person’s inner chaos (Curry & Kasser, 2005; Thomas & Roberts, 2012). Without the structure created through the directions and the circle shape provided by the “Zendala”®, the person would need to find their own structure in the chaos of a blank page, which may induce anxiety rather than reduce it (Curry & Kasser, 2005). Curry and Kasser (2005) interviewed their free form group to find that the free form group craved additional direction that a constructed mandala, in this study a “Zendala”®, would provide. Curry and Kasser’s (2005) further research section suggested testing if the pre-drawn format was necessary to reduce anxiety or if other structured figures, such as simple designs, would yield similar results. Part of this study involved coloring the “Zendala’s”® Zentangle® patterns. Mandalas, and by proxy “Zendalas”®, can have a calming effect during times of stress or anxiety because coloring mandalas can be considered a simple activity (Schrade et al., 2011). Although all of the information provided on “Zendalas”® is inferred from previous studies on mandalas, there appears to be cross-applicability of concepts between mandalas and “Zendalas”®. Due to a lack of research studies, there is no other information on Zentangles® or “Zendalas”® at this time.

### **The Anxious Emotional State**

In 2010, a report by the Anxiety Disorders Association of America reported that 40 million Americans suffer from a type of anxiety disorder; of that 40 million, 75% of

them experience their first symptoms by the age of 22 (as cited in Sandmire et al., 2012). This study used college students as its population, and 22 years old is within the age range of the “traditional” college student - ages 18-24; approximately 57% of undergraduates, in general, are considered traditional students (National Center For Education Statistics, n.d.). In 1994 Janowiak and Hackman (as cited in Rausch et al., 2006) reported 65% of Americans polled felt a significant amount of stress one or more times a week. Additionally, 18.1% of all adults living in the United States can be categorized as having one of the six anxiety disorders identified in the *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition, Text Revision* (Sandmire et al., 2012). Since anxiety and its accompanying disorders are the most common mental health concern in the United States, this was what drove researchers like Curry and Kasser (2005) and Henderson et al. (2007) to study ways to alleviate said anxiety (Sandmire et al., 2012; Small, 2006).

### **How Does Anxiety Differ from Stress?**

It is paramount to distinguish the difference between anxiety and a stress response since they are used so interchangeably in anxiety studies without the definition of the two terms explained. This study looked at the anxious response to a stress inducing activity. Anxiety is considered akin to a fear response, but anxiety is more of a long-term generalized state of distress than fear and is considered an abnormal state of fear (Lamia, 2011; van der Venet & Serice, 2012). Anxiety is usually triggered and maintained on a long-term basis by something non-specific; anxiety produces the same physiological arousal, such as nervousness and apprehension, that a fear response would cause in response to a threat (Lang, Davis, & Ohman, 2000). Due to anxiety’s non-specific nature, it represents an emotional state difficult to “run away” from since there is a constant

vigilance towards a future unknown threat with no clear stressor - any agent that can evoke the stress response (Lamia, 2011; Schrade et al., 2011). Excessive, chronic anxiety can develop into the mental health disorder diagnosis of Generalized Anxiety Disorder (Morrison, 2006). These individuals no longer are able to control their anxious response, and instead the anxiety cripples their capacity to function well in daily functioning. Generalized Anxiety Disorder affects 3-5% of all adults (Morrison, 2006).

Conversely, stress is considered the short term response to a stressor (Schrade et al., 2011). Stressors come from concrete life events, such as academic performance in college (Oman et al., 2008). Stress may encompass physical and emotional responses as a coping mechanism (Oman et al., 2008). Chronic stress can progress into anxiety, which may in turn progress into a mood disorder, and unfortunately, once chronic stress becomes anxiety, even with the stressor(s) removed, anxiety can remain (Vyas, Pillai, & Chattarji, 2004). Presumably, preventative measures, such as using mandalas, may mitigate the symptoms of stress and prevent or delay anxiety.

### **Art Therapy Assisting in Anxiety Reduction**

The treatment of anxiety can be dicey due to its nonspecific nature of symptoms (Chambala, 2008). A method to treat anxiety without needing to know the potential genesis is using art therapy, due to its general effectiveness through multiple studies in treating anxiety (Curry & Kasser, 2005; van der Venet & Serice, 2012). Art therapy is a fostered relationship between a client (a person seeking therapy) and an art therapist that offers the client a means to “talk” about feelings through a non-verbal mode of communication (De Petrillo & Winner, 2005; Sandmire et al., 2012). For clients suffering from anxiety, being asked to verbally share information about their backgrounds may cause additional stress because it requires the client to actively recall

said anxiety (Chambala, 2008). An art therapist can help anxious clients through the process of creating art find a means to communicate their unconscious feelings, externalize feelings, sublimate feelings, alleviate their anxiety, improve their mood through catharsis, and find ways reduce stress, such as through coloring mandalas (De Petrillo & Winner, 2005).

### **Mandalas Causing Anxiety Reduction**

Several studies done over the past decade have sought to expand upon the limited empirical information on the effectiveness of mandalas in relieving or reducing the effects of anxiety on persons in an art therapy setting. Most studies done in the 1970's were case studies and clinical observations made by early pioneers of mandala use, such as Kellogg et al. (1977). Slegelis's (1987) study paved the way for empirical research on the use of mandalas as a therapeutic tool in art therapy. Slegelis (1987) concluded that mandalas have calming and healing properties, but the study's design and data were limited, which limited the applicability of the results. Interestingly, as late as the 1990's through the year 2000, mandala studies still used the case study and clinical observation format to determine the mandala's effectiveness in anxiety reduction (Henderson et al., 2007). These studies were more specific in population focus than their 1970-80's counterparts, concluding that mandalas were effective therapeutically for those with schizophrenia, dissociative disorders, dementia, attention deficit/hyperactivity disorder, and childhood sexual abuse (Henderson et al., 2007).

The genesis of modern (mid 2000's to present) research on the effectiveness of mandalas in being able to reduce anxiety was Curry and Kasser's study (2005) on the effectiveness of pre-drawn mandalas, pre-drawn plaid pattern, and free-form mandalas in reducing anxiety in undergraduate students. Their procedure involved a pre-test, post-test

design using the SAI. Participants were administered the SAI three times: upon entry to the study, after a four-minute writing exercise designed to induce stress (e.g. “Think about a time that you have felt most fearful”), and after completing a 20-minute randomized group coloring exercise: either the pre-drawn mandala, the pre-drawn plaid, or the free-form mandala (Curry & Kasser, 2005). Anxiety reduction was found only in the plaid and pre-drawn mandala groups but not the free form group (Curry & Kasser, 2005). The plaid and pre-drawn anxiety reduction was hypothesized to potentially be the result of their equally complex design, but what specifically was the cause of the anxiety reduction remained a mystery to Curry and Kasser, thus sparking additional studies.

Curry and Kasser’s study currently has one replication study to, amongst other goals, increase the validity and reliability of Curry and Kasser’s work. Van der Vennet and Serice (2012) replicated Curry and Kasser’s study following the exact same procedure (with the exception of slightly different colored pencil colors) with a similar population: graduate students. Van der Vennet and Serice’s (2012) results differed from Curry and Kasser’s (2005) showing a clear distinction between the three interventions: pre-drawn mandalas, plaid pattern, and free form in their ability to reduce anxiety. All three reduced anxiety; the pre-drawn mandala produced the highest reduction in anxiety, followed by plaid, and the free form mandala was the least effective at anxiety reduction overall (van der Vennet & Serice, 2012).

Small (2006) also expanded on Curry and Kasser’s (2005) original study. Although Small (2006) kept some of the main elements of Curry and Kasser’s study the same: pre-drawn mandala, plaid pattern, and pre/post-test design, Small additionally tested the spiritual aspects of mandalas and introduced two new coloring directives: mandala coloring with a brief description of the spiritual associations of mandalas and

using a completely free form design (no mandala expected). Small (2006) concluded that there were no differences in anxiety reduction between the coloring interventions.

Henderson et al. (2007) incorporated the spiritual aspects of mandalas introduced by Small (2006) and the depressive emotion that tends to be correlated with anxiety into the measures of their study; they also used the full STAI to further test mandalas in relation to state and trait anxiety. Henderson et al. (2007) was the only study found that used a constructed mandala directive: they gave directions to the participants to create a mandala shape and fill the mandala with feelings or emotions related to trauma using symbols, patterns, and/or colors that felt right to them. The only statistically significant outcome to their study was that drawing mandalas reduced the symptoms of post-traumatic stress disorder (Henderson et al., 2007). They were also unable to answer their research question of what exactly the reason(s) were for anxiety reduction when engaging in mandala coloring.

Sandmire et al. (2012) took some of the concepts outlined in Curry and Kasser (2005) and created a new study based on their interpretations of Curry and Kasser's meta-messages behind their results. Sandmire et al. (2012) in particular wished to look at the possibility of mandala coloring causing a trance-like meditative state or if the act of coloring itself reduced anxiety. Sandmire et al. (2012) used the full STAI-Form Y in a pre/post-test design. They asked the participants to choose between one of five art interventions: pre-drawn mandalas, free-form (defined as a blank sheet in this study) painting, collage making, clay work, or drawing with a prompt (i.e., still life) (Sandmire et al., 2012). Their results indicated that their population, college students, could not distinguish between state and trait related anxiety, but regardless, their state anxiety scores dropped significantly more than their trait anxiety scores with any of the art



interventions (Sandmire et al., 2012). Mandalas were not found to have a higher state or trait anxiety level reduction than the other interventions (Sandmire et al., 2012).

### **Art Therapy and Meditation Coupled with Anxiety Reduction**

Art therapy and meditation have been shown to aid in stress reduction and treatment of anxiety (Kellogg et al., 1977). Art therapy's manipulation of art materials in order to create an art product offers a nonverbal, tactile, and visual outlet to communicate and address someone's anxiety through in part the "side effect" of art therapy's meditative properties (Sandmire et al., 2012; Small, 2006). Csikszentmihalyi (1997) found the process of producing art produces a trance-like state, and the art production process is deemed of therapeutic value to those that engage in the process (as cited in Sandmire et al., 2012). In 1975, Benson and Klipper (as cited in Sandmire et al., 2012) established a positive link between repetitive activities, like coloring and pattern making, in artwork production and a state of relaxation. Small (2006) similarly asserted that coloring mandalas as a form of art therapy led to the individual entering a meditative state, which can encompass self-discovery and improved emotional regulation. Sandmire et al.'s (2012) study reinforces the concept that entering a trance-like or meditative state can decrease anxiety, and if art therapy can create a meditative response, then both art therapy and meditation can assist in reducing anxiety.

### **General Benefits of Meditation**

Meditation tends to be overlooked or avoided for use in clinical settings due to its association with spiritual and/or religious realms (Rausch et al., 2006). However, there are physical and psychological benefits to the use of meditation, such as decreasing anxiety and stress through a temporary escape from the demands of everyday life (Rausch et al., 2006; Sandmire et al., 2012). In 2003, Wolf and Abell (as cited in Rausch

et al., 2006) concluded that meditation also increased the recovery rate of individuals exposed to a stressful event (called autonomic recovery). Benson and Klipper (1975) noted that meditation, along with all other relaxation techniques, elicits a generalized relaxation response in the brain. In 1976, Davidson and Schwartz's study (as cited in Rausch et al., 2006) saw meditation as a cognitive technique, which led them to postulate that meditation can produce effects primarily in the domain of cognitive anxiety. Rausch et al.'s (2006) study was one of the few studies done on the effects of meditation on college students. Their study concluded that meditation, when used to ameliorate short term stress reactions, had greater therapeutic potential than previously realized (Rausch et al., 2006).

### **Mindfulness**

Meditation is thought to have two distinct styles: mindfulness and concentrative, but in practice, most meditative practices fall somewhere between these two poles (Cahn & Polich, 2006). Some of the observed benefits of meditation include: improved immune system function, improved academic performance, improved concentration, improved self-control, improved ability to emotionally regulate, increase awareness of and maintenance of positive emotions, anxiety symptom reduction, and reduced arousal to stressors (Erisman & Roemer, 2012; Oman et al., 2008). These extensive benefits can be gained through the physical processes involved in meditation, called the relaxation response (Rausch et al., 2006). The relaxation response can be used to target cognitive or somatic ills (Rausch et al., 2006). Cognitively-based meditative practices can produce effects that target the parts of the brain responsible for anxiety, such as the amygdala (Rausch et al., 2006; Vyas, Pillai, & Chattarji, 2004).

Mindfulness based meditative practice places more emphasis on the benefits of practice than categorizing what is happening during a session (Cahn & Polich, 2006). Rausch et al.'s (2006) pilot study sought to measure state anxiety levels of undergraduate students after a mindfulness meditation intervention, a progressive muscle relaxation (a somatically targeted meditation) meditation, or with no meditation intervention. Although the mindfulness meditative intervention and the progressive muscle relaxation meditative intervention achieved higher levels of state anxiety after the intervention, this may indicate the initiation of a coping response to prepare the body for stress which is seen as a normal coping response to meditation (Rausch et al., 2006). The study ultimately concluded that meditation can be used to ameliorate state anxiety reactions (Rausch et al., 2006).

### **Anxiety in College Students**

The past decade (2000-2010) was known as the “Age of Anxiety” as abnormally high levels of anxiety were experienced by the general populace due to a variety of proposed environmental factors (Curry & Kasser, 2005; Small, 2006). It comes as no surprise that there is a naturally high incidence of anxiety among college students as is, much less coming off the cusp of a decade with abnormally high anxiety levels (Sandmire et al., 2012). Common factors that cause anxiety include, but are not limited to, academic performance, concerns with their future, and interpersonal relationship turmoil (Sandmire et al., 2012).

There is a direct link between high anxiety levels, physical and psychological issues, and elevated blood pressure (Oman et al., 2008; Schrade et al., 2011; Small, 2006). This can progress psychologically into a perceived inability to cope with life, helplessness, loss of control, feelings of failure, anger, and/or paradoxically, make the

person more anxious (Schrade et al., 2011). The symptoms can also escalate into a diagnosable mental health disorders such as phobias, panic disorders, and/or generalized anxiety disorder (Curry & Kasser, 2005; Sandmire et al., 2012).

### **Art Making can Help Anxiety in College Students**

Studies involving college students and art production have almost universally found art production to be an effective intervention against anxiety (Curry & Kasser, 2005; De Petrillo & Winner, 2005; Oman et al., 2008; Schrade et al., 2011; Small, 2006; van der Venet & Serice, 2012). Going as far back as Freud, he believed that when one is distressed the act of creating art can allow for the expression of negative emotions (De Petrillo & Winner, 2005). Art production provides a vehicle for repressed anxiety and/or negative emotions such as fear, which can aid in emotional regulation (Cahn & Polich, 2006; Small, 2006). Bell and Robbins (2007) found that art production can significantly decrease negative emotional states. In 2008, Kuchta's (as cited in Schrade et al., 2011) study measuring mandala coloring's effects on heart rate found that participants achieved greater relaxation and heart rate variability coloring mandalas than her control group; this study's results lends credibility to mandala coloring being used to help alleviate corporeal symptomatology. In fact, "...the very nature of art creation can provide an individual with choice, freedom, and power, which are experiences of agency often lacking in individuals..." (Curl, 2008, p. 165), which strongly implies that the very act of art creation brings about positive changes in mental health. The production of art also creates and involves emotional catharsis, which can help to reduce stress and anxiety (Curl, 2008).

### ***State Trait Anxiety Inventory***

Since Spielberger first conceived the idea of deconstructing the emotion of anxiety, anxiety has been viewed as having two parts: state anxiety (transitory feelings of fear or worry) and trait anxiety (the stable tendency to respond anxiously to stressful situations, a relatively permanent personality characteristic) (Bowling, 2001; Kantor, Endler, Heslegrave, & Kocovski, 2001; Spielberger, 1966). The *State Trait Anxiety Inventory* (STAI) was developed in the 1960s and revised in 1983 in order to remove aspects of the scale that were somewhat geared to depression (Bowling, 2001). The STAI measures a person's tendency towards an anxious response and their current feelings of anxiety using self-reporting (Bowling, 2001; Curl, 2008).

### **Conclusion**

Based on Curry and Kasser's (2005) work on mandalas reducing anxiety, the following recommendations for further study were made: whether simple designs would yield similar anxiety reduction results and the possible anxiety reducing qualities of creating mandalas versus coloring pre-drawn ones. Van der Venet and Serice's (2012) results found that free form mandalas were ineffective with reducing anxiety due to the participants struggling with lack of direction. Henderson et al. (2007) mentioned that an area for further exploration, based on Curry and Kasser's (2005) results, could be whether the calming effects of art therapy in general or the effects of actually creating a mandala reduce anxiety. This study plans on furthering Curry and Kasser's (2005) and van der Venet and Serice's (2012) work by adding validity to it and exploring some of these recommendations/findings. This study uses the most tested form of mandala-the pre-drawn and tests it against the constructed "Zendala"® and the unstructured mandala, a slightly more structured form than a free form mandala, because it starts with a blank

circle. Along with the questions raised by these researchers, this study hopes to answer the question, “Which creates a greater reduction in anxiety using the State Anxiety Inventory: pre-drawn mandalas, constructed mandalas, or unstructured mandalas?”

## Chapter Three: Methodology

### Overview

The research methodology for this study is an experimental quantitative research design inspired by Curry and Kasser's (2005) and van der Venet and Serice's (2012) research protocols. This study specifically tested whether a pre-drawn mandala shape, a constructed mandala shape-"Zendala"®, or an unstructured mandala circle shape had a greater reduction in anxiety levels of college students (graduate and undergraduate) when students were exposed to anxiety through a four-minute writing exercise to test the research question of which of the types of mandalas previously listed creates a greater reduction in anxiety. The data was collected from a series of participant groups, with a maximum group size of 21 adults, using a randomized, pre-test and post-test design using the *State Anxiety Inventory* (SAI) instrument to measure the study's results. The participants had their anxiety measured with *State Anxiety Inventory* (SAI) three times: to measure participants' baseline anxiety at Time 1 (T1), after the induction of the anxious mood using the four-minute writing assignment which is symbolized for this study's purposes as Time 2 (T2), and after the randomized intervention-either a pre-drawn (Appendix G), constructed (Appendices H, I, and J), or unstructured mandala (Appendix Q), which is symbolized as Time 3 (T3). The included forms used in the data collection are the consent form (Appendix B), art therapy confidentiality form (Appendix C), demographic form (Appendix D), and three testings of the *State Anxiety Inventory*-T1, T2, and T3.

### Procedure

To conduct this study, participants were recruited by advertising through flyers (see Appendix N) around the college's campus, a digital image of the flyer on the college clubs' Facebook pages to advertise the study, and by verbally contacting professors from undergraduate and graduate level college classes to ask about devoting class time for this study. Interested potential participants were initially contacted using the script provided by Appendix P by the principal investigator (PI) to arrange a time and date for the group of students to participate in the study. The PI wrote the participants' information on the participant signup sheet (see Appendix M). After participants set a time and date with the PI for the study, the PI reserved a room on the college's campus to conduct the study, and the PI ensured the mutual availability of the licensed mental health counselor to be present during the course of the study.

In preparation for the day of the study, the PI created manila folder packets for all group participants. Each packet contained a Consent form (see Appendix B), Art Therapy Confidentiality Form (see Appendix C), Demographic Questionnaire (see Appendix D), the Pre-Test *State Anxiety Inventory* (T1), the writing assignment (see Appendix F), the Post-Test *State Anxiety Inventory* (T2), either a pre-drawn mandala (see Appendix G), known as Group 1, the "Zendala"/Zentangle® mandala (see Appendix H), known as Group 2, or the unstructured mandala (see Appendix Q), known as Group 3, the accompanying instructions (see Appendices I-J) if the participant was randomly assigned to Group 2, the Post-Test *State Anxiety Inventory* (T3), and the de-briefing handout (see Appendix K). There were an equal number of manila folders containing either a pre-drawn mandala, "Zendala"/Zentangle® mandala, or an unstructured mandala. If an even number of participants were in attendance, an odd number of manila folders were



provided and placed out on the tables of the study's room (since there are three types of mandalas tested). All the data collection forms of the manila packets were assigned an arbitrary number per manila folder packet.

On the pre-appointed day of the study, participants met the PI at a mutually agreed upon time and date. Upon entry to the testing area, participants were told to sit at locations with a manila folder. These manila folders were previously shuffled so the researcher did not know the order of the folders. Therefore, participants were randomized into either Group 1 (pre-drawn mandala), Group 2 ("Zendala"/Zentangle® constructed mandala), or Group 3 (unstructured mandala) based on where they choose to sit. The folders were placed every other seat to discourage participants from viewing other participant's work. Art supplies in the form of a box of six Crayola® Washable Broad Line Markers: Red, Orange, Yellow, Green, Blue, and Purple and a black ball-point pen (for filling out forms) were provided in a clear plastic bag with the folders. Markers were chosen over van der Vennet and Serice's (2012) study's six colored pencils due to hypothesized participant ease of use- marker strokes cover more area, thereby potentially decreasing the time needed to complete the mandala, lowering unnecessary frustration, and marker's tips generally do not break off.

The PI provided verbal general instructions (see Appendix O) for the duration of the study. With the aid of the PI's verbal instruction, participants completed the Consent form, Art Therapy Confidentiality Form, the Demographic Questionnaire, the Pre-Test *State Anxiety Inventory*, the writing assignment, the Post-Test (T2) *State Anxiety Inventory*, and the Post-test (T3) *State Anxiety Inventory*. The participants received either a pre-drawn mandala, the "Zendala" mandala with accompanying Zentangle® instructions, or the unstructured mandala to color, depending on which randomized group

they were assigned to. The PI provided general instructions, and additionally there were more written instructions included on the three mandalas. These instructions were meant to decrease performance anxiety and account for the varying degrees of structure to the mandala coloring. The pre-drawn provided the most structure- it included written instructions and a pre-drawn design. The constructed mandala (“Zendala”) had a circle shape with a “string” beginning pattern, written instructions on the “Zendala” page, and three additional instruction pages with written and visual directions on how to create the three Zentangle® patterns. The unstructured mandala had a circle shape and open-ended written instructions. If someone required their mandala directions read the PI would have read the directions aloud to the individual, however, no one requested this assistance. Each study group’s mandala directions were not read aloud as to not confuse the participants and introduce new elements to this study. Participants were allowed up to 20 minutes to complete their mandala. After 20 minutes, participants were asked to place their markers down and complete the Post-Test *State Anxiety Inventory* (T3). After the Post-Test *State Anxiety Inventory* (T3) is completed, participants were read aloud the Verbal Debriefing form (see Appendix L). The Verbal Debriefing allowed participants to evaluate their current emotional state and provided them an opportunity to ask for help from the PI, the licensed mental health counselor, and/or the college’s counseling center.

Participants were given the De-Briefing Handout (see Appendix K). The participants were told to take the De-Briefing Handout with them in case they experience psychological discomfort at a future point after participating in the research study. The De-Briefing Handout contained information on the PI, Dr. van der Venet PhD, LCAT, LMHC, ATR-BC, CGP, and the college’s counseling center.

At this point, the study was completed. Participants were thanked for their participation and welcomed to the Pre-Packaged Rice Krispie Treats® provided in the back of the room, and they were offered the opportunity to enter into a drawing for one of three local gift certificates to venues within walking distance (up to 3 miles) from campus. The drawings were held at the end of the study. Participants were contacted and provided 10 days to claim their prize. If a participant did not collect their prize after 10 days, they forfeited the prize. A new winner was drawn and contacted until the prize was collected.

### **Participants and Setting**

The participants and setting were current students, undergraduate or graduate, from a college in the northeast. The target number was 50 total participants; the actual number of participants was 42. The research was collected in groups of no larger than 21 participants per group at a time. The students must have been the age of majority: over age 18, but less than age 65. Participants must have completed all parts of the study for inclusion in the data results. There are no exclusions based on race, religion, socioeconomic status, sex, sexual orientation, gender expression, or immigration status; however, a majority of the voluntary participants were female, Caucasian, and Graduate students with an Art Therapy or a Social Work major. The study's setting was on the college's campus and agreed upon by all party members involved. Whatever room was chosen, a licensed professional mental health provider was also present should any participant need assistance.

### ***State Trait Anxiety Inventory***

The *State Trait Anxiety Inventory* (STAI) measures a person's tendency towards an anxious response and their current feelings of anxiety using self-reporting (Bowling,

2001; Curl, 2008; Spielberger, 1966). The STAI is currently one of the most heavily used anxiety instruments in research studies (Potvin et al., 2011).

### **Instrument Used- STAI-Y, A Variant of the State Trait Anxiety Inventory**

This study used the *State Anxiety Inventory* (SAI) to measure the participants' current state of anxiety (Spielberger, 1977). This version of the STAI was used since it better served the purposes of this study, to measure state anxiety only, took only 7-10 minutes to administer, and mirrored the measurement tool used by previous mandala studies (Curry & Kasser, 2005; Curl, 2008; Potvin et al., 2011; Small, 2006; van der Venet & Serice, 2012).

Since the versions of the STAI can be confusing, the SAI is a part of the STAI-Y. The STAI-Y divides the 40 question *State Trait Anxiety Inventory* instrument into two distinct sections- the *State Anxiety Inventory* (Form-Y1) and *Trait Anxiety Inventory* (Form-Y2) (each section is 20 questions) (Sandmire et al., 2012; Spielberger, 1983). The four point Likert scale questions used have been shown to be positively correlated with the emotion of anxiety (Sandmire et al., 2012). The SAI shows good internal consistency, test-retest reliability, and construct validity (Potvin et al., 2011).

### **Justification of SAI use in this study.**

Beyond the SAI's widespread use in relevant studies and high reliability and validity as an instrument to measure anxiety, the SAI was used in this study because it is less oriented toward somatic symptoms of anxiety (Potvin et al., 2011). Other widely used anxiety scales such as the Beck Anxiety Inventory and the Hamilton Anxiety Inventory are more oriented to somatic symptoms like pain and difficulty breathing (Potvin et al., 2011). Somatic symptoms typically do not accompany temporary anxiety, such as the four-minute anxiety inducing writing exercise that this study used, as

evidenced by no mention of somatic symptoms in any of the SAI measuring studies listed in this study.

Curry and Kasser (2005), Sandmire et al. (2012), and van der Venet and Serice (2012), to name a few studies, all administered the SAI/STAI-Y immediately after the intervention. Most likely, the anxiety “kicked up” from the events of the immediate study would cause a spike in the state anxiety levels versus the trait anxiety levels (Sandmire et al., 2012). Sandmire et al. (2012), in their discussion section, hypothesized that the anxiety relieving effects of mandala coloring/art making in general may only be evanescent, with anxiety returning to “normal” levels within 1-2 weeks after the intervention. It therefore makes sense to use an instrument designed for state anxiety.

### **Data Collection**

The data was collected over a three week timespan during the Spring semester of 2013 at the college, mid-January 2013 till the first week of February 2013, over a series of group sessions conducted at an agreed upon location on the college’s campus by all parties involved. The data collected from each participant were three SAI measurements (T1, T2, and T3) and their randomly assigned mandala coloring group response (group 1, group 2, or group 3) in order to either confirm or deny the study’s hypotheses. The demographic form data was collected in order to make generalizations about the group represented by the participants as a whole.

### **Data Management**

In regards to the data collected by the study, every effort was taken to ensure the confidentiality of the participants in this study. Each participant was assigned an identification number which was used instead of the participants’ names on all documentation following the initial contact information and the consent forms. All data

gathered during the course of the study was aggregated. Data collected is stored on a password protected computer hard drive, and a DVD copy of the file was provided to the PI's advisor, Dr. van der Venet, which is also password protected. All physical copies of the participants' data are stored in a locked file cabinet inside Dr. Renee van der Venet's office at the college for five years after the study was completed. The electronic file is stored on the PI's laptop hard drive for five years after the study was completed. When five years has passed, the data will be deleted from the PI's laptop using advanced hard-drive wiping software. The DVD and the physical data kept by Dr. van der Venet will be destroyed after five years.

### **Data Analysis**

The quantitative data was analyzed by utilizing the Statistical Package for the Social Sciences (SPSS). The change in the population's total SAI scores from T2 to T3 were measured using a one-way analyses of variance (ANOVA) to mirror the data analysis procedure done by van der Venet and Serice (2012) (Table 6). The effects of the mandala intervention: unstructured, pre-drawn, and "Zendala"® and/or time upon the change in the population's total SAI scores from T2 to T3 were measured using a 2 X 3 analyses of variance (ANOVA) (Table 7). Changes in anxiety levels of the three groups between T1 and T2, T2 and T3, and T1 and T3 were compared using paired sample *t*-tests (van der Venet & Serice, 2012) (Table 3). How much change exists between the anxiety levels of the three mandala intervention groups at  $\Delta T1$  and  $\Delta T2$ ,  $\Delta T2$  and  $\Delta T3$ , and  $\Delta T1$  and  $\Delta T3$  were compared using independent sample *t* tests (van der Venet & Serice, 2012) (Table 5). The mean and standard deviation of the changes in anxiety levels between the three mandala intervention groups and the individual T1, T2, and T3 scores were obtained (Table 2). The mean and standard deviation of how much change in

anxiety levels exists between the three mandala intervention groups at  $\Delta T3-\Delta T1$ ,  $\Delta T2-\Delta T1$ , and  $\Delta T3-\Delta T2$  scores were also obtained (Table 4).

The Demographics Form (Appendix C) was also analyzed using SPSS. The demographics were only measured in terms of frequencies and percents as the demographics form only looked at the total sample size similarities and differences (Table 1).

### **Hypotheses and Null Hypotheses**

This study addressed the question: “Which creates a greater reduction in anxiety using the *State Anxiety Inventory*: pre-drawn mandalas, constructed mandalas, or unstructured mandalas?” The research hypotheses were that both the pre-drawn mandalas and unstructured mandalas would yield statistically similar ( $p < .05$ ) results in anxiety reduction from T2-T3 ( $H_a1$ ) and both the pre-drawn and unstructured mandala groups would have a greater anxiety reduction from T2-T3 than the “Zendala”® ( $H_a2$ ). The null hypotheses were that the pre-drawn and unstructured mandalas will not yield statistically similar ( $p > .05$ ) results in anxiety reduction from T2-T3 to each other ( $H_o1$ ) and the “Zendala”® group will have a greater reduction in anxiety than both the pre-drawn and unstructured mandalas ( $H_o2$ ). Since there were several variables in this study, one of several additional null hypotheses may have occurred; this study will highlight two additional null hypotheses for future discussion: No mandala intervention groups at T3 were successful in statistically significant anxiety reduction to baseline (T1) or below baseline ( $H_oA$ ) and the writing intervention was not statistically significant at increasing anxiety ( $H_oB$ ). The null hypotheses ( $H_o1$ ), ( $H_o2$ ), ( $H_oA$ ), and ( $H_oB$ ) will either be accepted or rejected through the results of the various types of ANOVA analyses (one-way and 2 X 3), the paired/independent sample  $t$ -tests.

If the ANOVAs indicate that the groups had a statistically significant change in anxiety at T2-T3 and if the independent and paired sample *t*-tests indicate that mandalas reduce anxiety with a low *p* value (less than or equal to .05) then this study will reject ( $H_o1$ ) and ( $H_o2$ ) and therefore support ( $H_a1$ ) and ( $H_a2$ ). Given precedence by studies like van der Venet and Serice (2012) and Curry and Kasser (2005), this study's method of measurement is similar to what is used in current/recent mandala anxiety studies and therefore should yield results that support the hypotheses. These issues are addressed in Chapter 4.

### **Human Subjects Review Committee**

This research project was submitted to the Human Subjects Research Committee of Nazareth College on October 9, 2012. This research study was approved with stipulations on October 20, 2012. After making the appropriate changes, this research study was approved by the college's Human Subjects Research Committee on November 20, 2012 (see Appendix A).

### **Confidentiality**

Every effort was made to maintain the confidentiality of the subject's information and the data collected. There was no identifying information on documentation in this study outside the Consent forms. All data collected was assigned an arbitrary number per manila folder packet. A licensed therapist supervised the process. Any participant data collected by this study is stored on a password protected computer hard drive, and a DVD copy of the file was provided to the PI's advisor, Dr. van der Venet, which is also be password protected. All physical copies of the participants' data are stored in a locked file cabinet inside Dr. Renee van der Venet's office at Nazareth College for five years



after the study was completed. The DVD and the physical data kept by Dr. van der Venet will be destroyed after five years.

### **Reliability and Validity**

Since the SAI's inception in 1983, the SAI portion of the STAI has had many years of research to test its validity and reliability (Bowling, 2001; Curl, 2008; Curry & Kasser, 2005; Sandmire et al., 2012; Small, 2006; van der Venet & Serice, 2012). When tested, the SAI portion of the STAI rates higher in validity (Bowling, 2001). The SAI's reliability is also high ( $r = 0.93$ ) (Bowling, 2001). The SAI has an internal consistency within the acceptable range ( $\alpha = 0.90$  or higher) (Curl, 2008). The full STAI obtains anxiety results similar to measuring exclusively the physiological signs of anxiety, indicating the self-report format of the STAI to be valid in comparison to other measures (Kantor et al., 2001).

### **Bias**

This study was biased by the researcher's enrollment in Nazareth College and in a Creative Arts Therapy degree. The researcher may have been biased towards the study confirming the hypotheses. The researcher represents a member of the demographic majority of the college, with the exception of being a graduate student, and therefore, this may have contributed towards an omission bias. Due to a strong demographic majority at this college, 73-75% of the college's student body was Caucasian/White, female, and undergraduate, more than likely there was an inclusive bias (N. \_\_\_\_\_ College, 2013).

The participants may have inadvertently created, or been affected by, a co-intervention bias. A co-intervention bias occurs when some/all participants receive another unaccounted for intervention at the same time as the study's intervention (Sackett, 2011). The "Zendala's"® complex instructions, which 12 out of 13

“Zendala”® group participants needed additional assistance understanding, may have been a potential co-intervention bias. Additionally, a response bias may have occurred. The participants may have believed that they understand the goals of the study and adapted their mandala response(s). Due to the nature of the participants, a volunteer bias most likely occurred as volunteers are often different than non-volunteers.

In regards to the mandalas utilized in this study, no assumptions were made about the potential benefits of “Zendalas”®, since no previous studies have been conducted on “Zendalas”®. This study assumed that pre-drawn mandalas reduce anxiety due to the results of previous studies (Curry & Kasser, 2005; Henderson et al., 2007; Small, 2006; van der Venet & Serice, 2012). Assumptions made on unstructured mandalas, that they reduce anxiety to some extent, were extrapolated from previous studies on free-form mandalas and mandalas with some form of instruction (Curry & Kasser, 2005; Sandmire et al., 2012; Small, 2006; van der Venet & Serice; 2012).

## **Chapter Four: Results**

### **Introduction**

The data collected was analyzed using a statistical software package. The raw data included the participants' ID number, age, gender, association with the college, the participants' major, race/ethnicity, and the three State Anxiety Inventories (SAI) administered at times T1, T2, and T3. The data was analyzed by population and by the three mandala intervention groups using Statistical Package for the Social Sciences (SPSS). The data was analyzed by population and by group.

### **Demographic data**

The demographics of the participants were collected from each participant's Demographic form (Appendix D). The researcher calculated descriptive statistics from the demographic information about the population as a whole and by group, as defined by which of the three mandala intervention groups' participants were randomly assigned (Table 1). The descriptive statistics calculated included frequencies and percentages of the variables of gender, association with the college, the participants' major, the participants' race/ethnicity, and the mean, standard deviation, and range for age.

The research population consisted of 42 participants. The mean age of the population was 25.8 years old ( $SD = 8.2$ ). The minimum age of the population was 18 years old and the maximum age of the population was 48 years old (range = 30). The population was 83.3% female, 14.3% male, and 2.4% other. The participants were all affiliated with the college, where 45.2% and 54.8% were undergraduate students and graduate students respectively. Academic majors were Social Work (26.2%), Art Therapy (26.2%), Other (19.2%), and Music Therapy or Creative Arts Therapy (14.3%). As an observation, the majority of the population's academic majors fell within the

Human Services field ( $\approx 81\%$ ). The population's race/ethnicity was Caucasian/White (71.4%), Asian (4.8%), African American/Black (9.5%), First Nation (2.4%), Hispanic (9.5%), and Bi-Racial (2.4%). Most of the population's demographics matched the expected majority for this college: Caucasian/White and Female with a major within the Human Services field (N. \_\_\_\_\_ College, 2013).

### **Unstructured Mandala Group**

The research participants in the unstructured mandala group consisted of 14 participants. The mean age of the unstructured mandala group was 23 years old ( $SD = 5.9$ ). The minimum age of the population was 18 years old and the maximum age of the population was 41 years old (range = 23). The population was 92.9% female and 7.1% male. Fifty percent of the participants were affiliated with the college due to their status as undergraduate students, and 50% of the participants were affiliated with the college as graduate students. Their academic major was either Art Therapy or Other (28.6%), followed by 21.4% for either Creative Arts Therapy or Social Work. The population's race/ethnicity was Caucasian/White (71.4%), Asian (7.1%), African American/Black (14.3%), and Hispanic (7.1%).

The unique features of this group's majority versus both the general population and the other two groups' majorities were having the youngest age range, the youngest median age, no clear majority college affiliation, the most heavily weighted towards Female gender majority of the three groups, the largest percentage of persons identifying as Asian race/ethnicity of the three groups, and an academic major co-majority of "Other".

**Pre-Drawn Mandala Group**

The research participants in the pre-drawn mandala group consisted of 15 participants. The mean age of the unstructured mandala group was 24.9 years old ( $SD = 7.5$ ). The minimum age of the population was 19 years old and the maximum age of the population was 48 years old (range = 29). The population was 86.7% female and 13.3% male. Forty percent of the participants were affiliated with the college due to their status as undergraduate students, and 60% of the participants were affiliated with the college as graduate students. Their academic major was Art Therapy (33.3%), followed by 20% for either Music Therapy, Social Work, or Creative Arts Therapy, and 6.7% of the participants indicated Other. The population's race/ethnicity was Caucasian/White (73.3%), Asian (6.7%), First Nation (6.7%), and Hispanic (13.3%).

The unique features of this group's majority versus both the general population and the other two groups' majorities were having the most participants (15), the largest percentage majority of graduate students, the highest percentage of Music Therapy majors, the largest percentage majority of Art Therapy majors, and the largest percentage of persons identifying as Hispanic and First Nation race/ethnicity of the three groups.

**“Zendala”® Mandala Group**

The research participants in the “Zendala”® mandala group consisted of 13 participants. The mean age of the unstructured mandala group was 29.7 years old ( $SD = 10.0$ ). The minimum age of the population was 19 years old and the maximum age of the population was 48 years old (range = 29). The population was 69.2% female, 23.1% male, and 7.7% other. The participants were all affiliated with the college, where 46.2% were undergraduates and 53.8% were graduates. Their academic major was Social Work (30.8%), followed by 23.1% for either Art Therapy, Music Therapy, or

Other. The population's race/ethnicity was Caucasian/White (69.2%), African American/Black (15.4%), Hispanic (7.7%), and Bi-Racial (7.7%).

The unique features of this group's majority versus both the general population and the other two groups' majorities were having the oldest age range, the oldest median age, the least weighted towards Female gender majority of the three groups, the largest percentage majority of Social Work majors, the largest percentage of persons identifying as African American/Black and Bi-Racial race/ethnicity of the three groups, and the largest percentage population of persons identifying as a non-Caucasian/White race/ethnicity.

### ***State Anxiety Inventory Data and Analysis***

#### **Descriptive Statistics by Group**

Descriptive statistics (mean and standard deviation) were collected for the SAI scores from the participants' anxiety baseline score (T1), the anxiety score after the writing exercise (T2), the anxiety score after the mandala intervention (T3), and the difference in change in participants' anxiety between T3 and T2 for the total population, the unstructured, the pre-drawn, and the "Zendala"® groups (Table 2). The total population ( $N = 42$ ) had a mean pre-test SAI score at T1 of 35.4 ( $SD = 9.4$ ), a mean pre-test SAI score at T2 of 43.3 ( $SD = 12.0$ ), a mean post-test SAI score at T3 of 34.9 ( $SD = 10.0$ ), and the mean of the difference in change in anxiety from T3-T2 was -8.4 ( $SD = 14.1$ ). The unstructured group ( $n = 14$ ) had a mean pre-test SAI score at T1 of 35.5 ( $SD = 7.1$ ), a mean pre-test SAI score at T2 of 44.6 ( $SD = 11.9$ ), a mean post-test SAI score at T3 of 32.6 ( $SD = 9.7$ ), and the mean of the difference in change in anxiety from T3-T2 was -11.9 ( $SD = 13.2$ ). The pre-drawn group ( $n = 15$ ) had a mean pre-test SAI score at T1 of 36.1 ( $SD = 10.0$ ), a mean pre-test SAI score at T2 of 46.7 ( $SD = 11.5$ ),

a mean post-test SAI score at T3 of 36.4 ( $SD = 9.8$ ), and the mean of the difference in change in anxiety from T3-T2 was -10.3 ( $SD = 13.5$ ). The “Zendala”® group ( $n = 13$ ) had a mean pre-test SAI score at T1 of 34.5 ( $SD = 11.3$ ), a mean pre-test SAI score at T2 of 37.9 ( $SD = 11.8$ ), a mean post-test SAI score at T3 of 35.5 ( $SD = 11.1$ ), and the mean of the difference in change in anxiety from T3-T2 was -2.4 ( $SD = 14.7$ ). Based on the mean scores alone, the unstructured group was the only group to lower anxiety levels below the level at T1-baseline. The pre-drawn group almost matched the T1-baseline, missing baseline by a mean score difference of three-tenths (0.3) of a point.

Interestingly, the “Zendala”® group did not respond as strongly to the four-minute writing exercise (T1-T2) as the other two groups, and the “Zendala”® group also did not reduce anxiety levels to at or below T1-baseline from T2 to T3. The “Zendala”® group did decrease anxiety from T2 to T3 but only by -2.4 in comparison to -11.9 for unstructured and -10.3 for pre-drawn. Due to the unstructured’s and the pre-drawn’s results, the total population’s means show that T1 to T2 increased mean SAI scores (+7.9) and decreased mean SAI scores from T2 to T3 by -8.4. These results are graphically represented by Figure 1.

### **Paired Sample *t*-Tests by Group**

Paired sample *t*-tests were calculated to compare the change in anxiety for the unstructured, pre-drawn, and “Zendala”® groups at various SAI test times: T1-T2, T2-T3, and T1-T3 to (a) evaluate if the four-minute writing exercise induced anxiety (T1-T2), (b) evaluate if the intervention worked (T2-T3), and (c) to see if the intervention reduced anxiety at or below the base level measured at T1 (T1-T3) for each individual group (not comparing them yet to each other) (Table 3). For the unstructured group, there was a significant difference between the participants’ SAI scores at T1 to T2 ( $t(13)$

= -4.96,  $p < .05$ ), a significant difference between the participants' SAI scores at T2 to T3 ( $t(13) = 3.38, p < .05$ ), and there was no significant difference between the participants' SAI scores at T1 to T3 ( $t(13) = 1.09, p > .05$ ). For the pre-drawn group, there was a significant difference between the participants' SAI scores at T1 to T2 ( $t(14) = -4.68, p < .05$ ), a significant difference between the participants' SAI scores at T2 to T3 ( $t(14) = 2.97, p < .05$ ), and there was no significant difference between the participants' SAI scores at T1 to T3 ( $t(14) = -0.09, p > .05$ ). For the "Zendala"® group, there was not a significant difference between the participants' SAI scores at T1 to T2 ( $t(12) = -1.58, p > .05$ ), not a significant difference between the participants' SAI scores at T2 to T3 ( $t(12) = 0.58, p > .05$ ), and there was not a significant difference between the participants' SAI scores at T1 to T3 ( $t(12) = -0.23, p > .05$ ).

These results indicate that there was a statistically significant difference between T1-T2 and T2-T3 for the pre-drawn and unstructured groups, but there was not a statistically significant difference from T1-T3. This means that the four-minute writing exercise worked to induce anxiety for the pre-drawn and unstructured groups. Also, this means that the SAI scores for the pre-drawn and unstructured groups from T3 were not statistically different to the scores at T1-baseline. Therefore, the two interventions worked to reduce anxiety from T2 to T3 back to baseline (T1) levels. The null hypothesis ( $H_oB$ ) - the writing intervention was not statistically significant at increasing anxiety, can be rejected for the pre-drawn and unstructured groups. The null hypothesis ( $H_oA$ ) - no mandala intervention groups at T3 were successful in statistically significant anxiety reduction to baseline (T1) or below baseline, can also be rejected for the pre-drawn and unstructured groups because the SAI results at T3 are not statistically different from SAI results at T1-baseline for these two groups, whereas these T3 SAI results are



statistically significantly different from T2 for each group. Thus for the pre-drawn and structured groups, anxiety was induced by the four-minute writing exercise (T1 to T2), followed by reduction in anxiety by the respective group intervention (T2 to T3) where the resulting SAI values at T3 are similar to T1 (baseline) SAI values.

The “Zendala”® scores were not statistically significant at any point in the study. Given these results, the “Zendala”® group did not exhibit induced anxiety from the four-minute writing exercise. The “Zendala”® group did not exhibit any statistically different change in anxiety from T1, T2, or T3. This is depicted in Figure 1. The null hypothesis ( $H_oA$ ) and ( $H_oB$ ) cannot be rejected for the “Zendala”® group. The “Zendala”® group’s anxiety did not change; therefore the experiment did not work for them.

### **Delta ( $\Delta$ ) Descriptive Statistics by Group**

Descriptive statistics (mean and standard deviation) were calculated for the Delta ( $\Delta$ ) SAI scores from T3 to T1, T2 to T1, and T3 to T2 for the unstructured, the pre-drawn, and the “Zendala”® groups (Table 4). The unstructured group had a mean  $\Delta T3-T1$  score of -2.86 ( $SD = 9.77$ ), a mean  $\Delta T2-T1$  score of 9.07 ( $SD = 6.84$ ), and a mean  $\Delta T3-T2$  score of -11.93 ( $SD = 13.19$ ). The pre-drawn group had a mean  $\Delta T3-T1$  score of 0.27 ( $SD = 10.94$ ), a mean  $\Delta T2-T1$  score of 10.60 ( $SD = 8.77$ ), and a mean  $\Delta T3-T2$  score of -10.33 ( $SD = 13.46$ ). The “Zendala”® group had a mean  $\Delta T3-T1$  score of 1.00 ( $SD = 16.01$ ), a mean  $\Delta T2-T1$  score of 3.38 ( $SD = 7.71$ ), and a mean  $\Delta T3-T2$  score of -2.38 ( $SD = 14.74$ ).

These results show that a dependent variable, most likely the writing exercise, increased the change in mean of  $\Delta SAI$  scores from  $\Delta T1$  to  $\Delta T2$  across all three groups, but the “Zendala’s”® results were not as substantial as the other two groups. There was

also a decrease in the change in mean of  $\Delta$ SAI scores from  $\Delta$ T2 to  $\Delta$ T3 across all three groups, which shows that a dependent variable, most likely the mandala interventions, decreased anxiety. These  $\Delta$ SAI results mirror the differences between the mean SAI scores in Table 2; Table 4's results seem to be confirming and supporting that the data from Table 2 is correct.

### **Delta ( $\Delta$ ) Independent Sample *t*-Tests by Groups**

Independent sample *t*-tests were calculated to compare the change in the Delta ( $\Delta$ ) SAI scores from T3 to T1, T2 to T1, and T3 to T2 to pairs for the unstructured, the pre-drawn, and the “Zendala”® groups as one way to evaluate the null hypotheses ( $H_o1$ ) and ( $H_o2$ ) (Table 5). For comparing the Delta ( $\Delta$ ) between the combined unstructured and pre-drawn groups, there was no significant difference at  $\Delta$ T3-T1 ( $t(27) = -0.81, p > .05$ ), no significant difference at  $\Delta$  T2-T1 ( $t(27) = -0.52, p > .05$ ), and there was no significant difference at  $\Delta$  T3-T2 ( $t(27) = -0.32, p > .05$ ). For the Delta ( $\Delta$ ) between the combined unstructured and “Zendala”® groups, there was no significant difference at  $\Delta$  T3-T1 ( $t(25) = -0.76, p > .05$ ), a significant difference at  $\Delta$  T2-T1 ( $t(25) = 2.03, p < .05$ ), and no significant difference at  $\Delta$  T3-T2 ( $t(25) = -1.78, p > .05$ ). For the Delta ( $\Delta$ ) between the combined pre-drawn and “Zendala”® groups, there was no significant difference at  $\Delta$  T3-T1 ( $t(26) = -0.14, p > .05$ ), a significant difference at  $\Delta$  T2-T1 ( $t(26) = 2.29, p < .05$ ), and no significant difference at  $\Delta$  T3-T2 ( $t(26) = -1.49, p > .05$ ).

These results show that the null hypothesis ( $H_o1$ ) can be rejected since no groups from T2-T3 were able to be significantly different from each other to reduce anxiety, thus both the pre-drawn mandalas and unstructured mandalas do yield statistically similar results. The null hypothesis ( $H_o2$ ) - the “Zendala”® group will have a greater reduction

in anxiety than both the pre-drawn and unstructured mandalas can be rejected because there was no significant difference between pairs: unstructured and pre-drawn group, unstructured and “Zendala”® group, and pre-drawn and “Zendala”® group for  $\Delta T3-T2$ . The “Zendala”® group does not have a greater reduction in anxiety than both the pre-drawn and unstructured mandalas.

### **One-Way ANOVA for Delta ( $\Delta$ )**

A one-way ANOVA was calculated from the  $\Delta T2-T3$  from the  $\Delta SAI$  scores of the unstructured, pre-drawn, and “Zendala”® groups in order to check against type I errors that can occur in multiple  $t$ -tests. A type I error occurs when the null hypothesis ( $H_o$ ) is true but is rejected. Only  $\Delta T2-T3$  was calculated due to the change from  $\Delta T2-T3$  being the most critical to accepting or rejecting the null hypotheses ( $H_o1$ ) and ( $H_o2$ ). The one-way ANOVA’s results highlighted that there was no significant change in anxiety levels from  $\Delta T2-T3$  ( $F(2) = 1.85, p > .05$ ) for the three groups (Table 6). The one-way ANOVA results support the rejection of ( $H_o1$ ) because the ANOVA results show that the pre-drawn and unstructured mandalas did yield statistically similar results by showing no significant change in anxiety levels from  $\Delta T2-T3$  for these groups. The ANOVA’s results also support the previous paired sample  $t$ -tests’ results showing that the pre-drawn and the unstructured groups did produce statistically significant change from  $T2-T3$  when looking at each group by itself. Also, the one-way ANOVA does support the independent sample  $t$ -test results, which compares the three groups with one another. Therefore, this ANOVA concludes that ( $H_o1$ ) can be rejected since there was no statistically significant change in anxiety levels from  $T2-T3$  based on all three mandala

interventions. The pre-drawn and unstructured mandalas did yield a statistically similar result.

( $H_o2$ ) can be rejected because the ANOVA showed there is no statistical difference between the three groups. Therefore, the “Zendala”® group does not have a greater reduction in anxiety than both the pre-drawn and unstructured mandala groups.

( $H_a1$ ) can be accepted because the pre-drawn and unstructured mandalas did yield statistically similar results and the paired sample *t*-tests support both groups reduced anxiety from T2 to T3.

## 2 X 3 ANOVAs

2 X 3 ANOVAs were calculated to compare the overall change in anxiety levels from SAI scores (T2-T3) and how they were influenced by either time and/or the unstructured mandala group, the pre-drawn mandala group, and the “Zendala”® mandala group. There was a statistically significant variable in the change in SAI scores in this study ( $F(1) = 14.88, p < .05$ ); this variable was labeled in this 2 X 3 ANOVA as time. The group by time interaction was not statistically significant ( $F(2) = 1.85, p > .05$ ). With the groups alone, interactions were not statistically significant ( $F(2) = 1.19, p > .05$ ). Given this result, ( $H_o1$ ) can be rejected, which is similar to the one-way ANOVA’s results. The pre-drawn and unstructured mandalas did yield statistically similar results. The 2 X 3 ANOVA also indicated that only time was a statistically significant variable in what decreased SAI anxiety scores throughout the study versus the mandala interventions. ( $H_o2$ ) can be rejected and ( $H_a1$ ) can be accepted; therefore, no mandala intervention was an effective means of reducing participant anxiety levels from the four-minute writing exercise, when compared to each other. Although the pre-drawn and

unstructured mandalas did yield statistically similar results, the 2 X 3 ANOVA supports time made the big difference.

### **Field Notes**

Over the course of the data gathering portion of the study, mid-January 2013 till the first week of February 2013, several potentially significant factors were observed in all groups: (a) the 20 minute time limit impacted participants by providing them either (i) too much time between mandala completion and T3's SAI or (ii) too little time to complete the mandala before T3's SAI; (b) related to this, participants still working on their mandala changed their behavior with the five minute and two minute announcement before the mandala coloring was completed; (c) the markers that were chosen for this study had caps that were difficult to remove and to cap when finished; (d) the "S:\_\_\_\_\_" (S blank) on the SAI form confused people and they did not know what to put in the blank; (e) the directions for the "Zendala"® confused almost all of the participants in that group; (f) the smaller the group, the more likely participants looked around at other's mandalas and communicated with others around them; and (g) since the packets were not stapled as a whole, participants were able to look ahead. Examples of the three types of mandalas are depicted in Figures 1 to 3.

## Chapter Five: Discussion

### Overview

This researcher was interested in determining which of the study's three mandala interventions- pre-drawn mandalas, constructed mandalas, or unstructured mandalas, created a greater reduction in anxiety using the *State Anxiety Inventory* (SAI). This study's research hypotheses were that both the pre-drawn mandalas and unstructured mandalas would yield statistically similar ( $p < .05$ ) results in anxiety reduction from T2-T3 ( $H_{a1}$ ) and both would have a greater anxiety reduction from T2-T3 than the "Zendala"® ( $H_{a2}$ ). The main null hypotheses were that the pre-drawn and unstructured mandalas will not yield statistically similar ( $p > .05$ ) results in anxiety reduction from T2-T3 to each other ( $H_{o1}$ ) and the "Zendala"® group will have a greater reduction in anxiety than both the pre-drawn and unstructured mandalas ( $H_{o2}$ ). This study highlighted two additional null hypotheses for discussion: No mandala intervention groups at T3 were successful in statistically significant anxiety reduction to baseline (T1) or below baseline ( $H_{oA}$ ) and the writing intervention was not statistically significant at increasing anxiety ( $H_{oB}$ ).

The one-way ANOVA and the 2 X 3 ANOVA results support the rejection of ( $H_{o1}$ ) because the one-way ANOVA and the 2 X 3 ANOVA results show that the pre-drawn mandala and unstructured mandala groups did yield statistically similar results by showing no statistically significant difference in change in anxiety levels from T2 to T3 for these two groups. The paired sample *t*-tests support that both these groups reduced anxiety from T2 to T3. Therefore, the pre-drawn mandala and unstructured mandala interventions are successful at reducing anxiety. ( $H_{a1}$ ) can be accepted. However, the 2

X 3 ANOVA results support that time made the difference in reduction of anxiety and not the interventions.

Likewise, ( $H_{o2}$ ) can be rejected because the one-way ANOVA and the 2 X 3 ANOVA demonstrated that there is no statistical difference between the three groups. Therefore, the “Zendala”® group does not have a greater reduction in anxiety than both the pre-drawn and unstructured mandala groups.

The additional null hypotheses ( $H_{oA}$ ) and ( $H_{oB}$ ) were not essential to the main hypotheses, but they served as additional supports for the reliability of the writing exercise in increasing anxiety ( $H_{oB}$ ) and the effectiveness of the mandala interventions decreasing anxiety to baseline anxiety levels or below baseline ( $H_{oA}$ ). If both of these additional null hypotheses were proven false, that would add credence to the methodology of this type of study and further solidify mandalas as a pathway to be further explored by future art therapists as a valid way to reduce state anxiety levels in clients.

## **Discussion**

### **Demographics**

Most of the population’s demographics matched the expected majority for this college: Caucasian/White majority (71.4%) and Female (83.3%) with a major within the Human Services field ( $\approx$  81%), thereby producing a largely homogenous group. Even though some of the population was solicited through flyers, this was a sample of convenience due to the majority of participants groups being affiliated with certain academic classes and the strong majority demographics present throughout the campus. Clearly there was a volunteer bias. All these factors may have contributed to the overall homogeneity of the 42 participant group.

*State Anxiety Inventory***The Anxiety Induction.**

The four-minute writing intervention: “Think about a time when you felt the most fearful,” was previously used and proven successful by Curry and Kasser (2005) and van der Vennet and Serice (2012) at increasing anxiety. Both Curry and Kasser (2005) and van der Vennet and Serice (2012) found that the writing exercise was highly significant in increasing anxiety (T2) from baseline (T1) amongst all three groups using a paired sample *t*-test ( $p < .05$ ) and that the groups did not differ from each other. Curry and Kasser (2005) and van der Vennet and Serice (2012) also used means and standard deviations to show that the writing exercise was successful. This study’s results from Tables 2 and 4 show (and graphically Figure 1) that the mean scores for all three groups did increase, by varying degrees: +9.07 for unstructured, +10.6 for pre-drawn, and +3.38 for “Zendala”®.

However, with these results of SAI scores increasing after the writing exercise was further explored by a paired sample *t*-test in Table 3 the “Zendala”® was found to not have statistically significant results in increasing anxiety. The pre-drawn and the unstructured mandala groups were able to achieve statistically significant results in increasing anxiety from the writing exercise. Why the “Zendala”® group differs from the other two groups remains an anomaly of the study, but clearly some unknown variable(s) caused the entire “Zendala”® group to not respond with the desired outcome to the writing exercise, which adds evidence to the possibility of a co-intervention bias. A co-intervention bias occurs when some/all participants receive another unaccounted for intervention at the same time as the study’s intervention (Sackett, 2011).



Due to the “Zendala”® group’s differences, Table 5 - the independent sample *t*-test, does show a statistically significant difference between T1-T2 when comparing the unstructured or pre-drawn with the “Zendala”® group. The unstructured and the pre-drawn groups seem to be fairly similar to each other on how much the participants’ anxiety increased from T1-T2, since differences between the two groups were far from significant. Due to these results, the ( $H_oB$ ) null hypothesis can be rejected for the pre-drawn and unstructured mandala groups due to the writing exercise producing a statistically significant ( $p < .05$ ) change in the participants’ base level anxiety. The ( $H_oB$ ) null hypothesis cannot be rejected for the “Zendala”® group due to unknown factors producing far less pronounced results in increasing participants’ anxiety from the base level.

### **The Interventions.**

Curry and Kasser (2005) found that the pre-drawn mandala was able to achieve a statistically significant ( $p < .001$ ) reduction in anxiety (T3) from the writing exercise’s increased anxious state (T2). Van der Vennet and Serice (2012) used an ANOVA which also indicated a statistically significant ( $p < .04$ ) reduction in anxiety from T2 to T3. This study’s results do not coincide with either predecessor’s mandala intervention results, interestingly even with the most studied pre-drawn mandala.

Looking at the SAI means (Table 2) and Delta ( $\Delta$ ) SAI means (Table 4) alone gave the initial impression that all three groups did decrease anxiety from T2 to T3; of note, the “Zendala”® group did not increase from the SAI baseline score to the anxious state SAI score and because of this, the “Zendala”® also did not decrease in anxious state from T2 to T3. The minute difference (-2.4) between the T2 to T3 SAI scores for the “Zendala”® group may have been caused by other variables besides the “Zendala”®

intervention and/or the “Zendala”® was not very effective at anxiety reduction. The pre-drawn and the unstructured both had larger differences between their T2 and T3 scores respectively (-10.33, -11.93). The pre-drawn group’s mean SAI score even dropped 2.9 points below baseline at T3. The unstructured group’s mean score came within three-tenths of being par with baseline. From mean scores alone, the pre-drawn and unstructured mandala interventions appeared to be producing desired results. The unstructured mandalas also decreased mean anxiety scores by a comparably large amount.

Similarly to the T1-T2 result, the paired sample *t*-test (Table 3) showed statistically significant results for T2-T3 for the unstructured ( $p < .05$ ) and pre-drawn ( $p < .05$ ) groups. The “Zendala”® group did not respond at any point to the intervention.

The result of the one-way ANOVA (Table 6) indicated that the Delta ( $\Delta$ ) SAI scores at T2-T3 were not statistically significantly different from each other, and the 2 X 3 ANOVA (Table 7) further showcased that the null hypothesis ( $H_{o1}$ ) could be rejected. The one-way ANOVA and the 2 X 3 ANOVA both support that the pre-drawn mandala and unstructured mandala groups did yield statistically similar results, although the 2 X 3 ANOVA supports time is the factor that contributes to the reduction of anxiety. ( $H_{o2}$ ) could be rejected since the “Zendala”® had little to no effect on anxiety levels. None of the mandala interventions were successful at statistically reducing anxiety from T2 to T3 when compared to one another. However, the one-way ANOVA and 2 X 3 ANOVA support that the pre-drawn mandala and the unstructured mandala group are statistically similar. In addition, the paired sample *t*-tests for these two groups support they both reduced anxiety from T2 to T3.

The paired sample *t*-test results (Table 3) support the rejection of ( $H_oA$ ). The SAI results at T3 are statistically different from SAI results at T1-baseline for the pre-drawn mandala group and the unstructured mandala group, whereas the T3 SAI results are statistically significantly different from T2 for each group. Thus for the pre-drawn and unstructured groups the SAI values at T3 are similar to T1 (baseline) SAI values so these two mandala interventions were indeed successful at bringing anxiety back down to baseline.

However, ( $H_oA$ ) cannot be rejected for the “Zendala”® group because anxiety did not change through the experiment.

### **Relationships to Previous Studies**

This study hoped to address some of the further study suggestions outlined by Curry and Kasser (2005) and van der Venet and Serice (2012), such as: “Does the type of geometric design used for coloring affect the results?” and “Does the use of pre-drawn mandalas versus another format of mandala produce different results?” Since all the mandala groups produced the same result: that the mandala intervention from T2 to T3 was not able to be statistically different from each other to reduce anxiety levels, this study cannot add any answer to these questions. This study also hoped to address Henderson et al.’s (2007) observation about Curry and Kasser’s (2005) study, “Although (Curry and Kasser (2005)’s) results show potential...the results could be interpreted in various ways, such as the calming effects of art therapy in general versus the effects of actually creating a mandala” (p. 149). According to the 2 X 3 ANOVA, the act of coloring a mandala was not therapeutic to decrease anxiety when comparing the three groups with each other; therefore Henderson et al.’s (2007) observation cannot be further explored. However, this study demonstrates that pre-drawn mandalas and unstructured

mandalas do behave in a similar way and reduce anxiety, although the 2 X 3 ANOVA showed time made the difference.

### **Testing the “Zendala”® Mandala and the Unstructured Mandala**

The constructed mandala has so far been only used and tested by Henderson et al. (2007) and Kellogg, Mac Rae, Bonny, and di Leo (1977) but no one has before empirically tested the “Zendala”® constructed mandala. The type of mandala this study refers to as an unstructured mandala, a blank mandala with written instruction, has not been tested before, at least within the scope of the literature reviewed for this study. Based on the results of this study, neither the “Zendala”® nor the unstructured mandala were successful in reducing anxiety levels in participants. Clearly, no overarching conclusions on the effectiveness of these types of mandalas can be drawn from either the “Zendala”® or unstructured mandala group due to the constraints of this study.

### **Limitations**

Similarly to Curry and Kasser (2005) and van der Venet and Serice (2012), this study’s population was a largely homogenous and small in sample size. The sample was also one of convenience. All these factors mean that the results are not able to represent the  $z$  value (the total population of humanity) nor can they be generalized. There was most likely a volunteer bias as well. As van der Venet and Serice (2012) mention, since the SAI is a self-reported measure of anxiety it can be flawed with various varieties of biases. This study most likely had a co-intervention bias, an additional unknown intervention taking place at the same time as the mandala intervention, at T2 to T3 since the “Zendala”® group lacked a response to any part of this study and all three of the mandala interventions did not statistically decrease anxiety from T2 to T3 when compared to each other (Sackett, 2011). Based on the field note observations, this

additional intervention may have been influenced by the mandala groups' 20 minute intervention time limit being too short or too long, the study's materials, the mandala interventions' directions, or the participant group sizes being too large or too small.

### **Recommendations**

One of the most important unanswered questions that arose over the course of this study was what exactly was being measured if there was time between when the participant completed the mandala till the participant completed SAI T3. The field note observations resulted in the 20 minute time limit to color the mandala impacting participants in some way by providing them with either (i) too much time between mandala completion and T3's SAI or (ii) too little time to complete the mandala before T3's SAI. One recommendation would be to provide a longer time limit, especially for the pre-drawn mandalas or to eliminate the time limit, but the proposition to eliminate a time limit could, without careful planning, bring its own share of negative considerations, especially if done in a group setting in which the group members wait to continue, as this study's methodology followed.

The "Zendala"® group did not respond to any portion of this study. The "Zendala"® group did not increase their anxiety level with the anxiety inducing four-minute writing exercise, and therefore, the "Zendala"® group could not decrease anxiety levels with the intervention because there was nothing to decrease. As a reminder, "Zendalas"® are normally completed by persons that were previously instructed in the Zentangle® method by a Certified Zentangle® Teacher (CZT). The Zentangle® method directions are complex, varied, and can take multiple sessions to master; the complexity of and new terms introduced by the Zentangle® method hindered the study's "Zendala"® intervention, since there had to be a teaching aspect to the directions in order to complete

the “Zendala’s”® tangles®: Printemps®, Cross Stitch®, and Corn Rows® properly. Ironically the tangles® used in this study were chosen due to their relatively simplistic-looking designs.

Therefore, for multiple reasons the type of “Zendala”® created in this study was not a good representation of what the Zentangle® experience can be like. Ideally participants would have been already instructed on how to complete a few tangles® and familiar with the concepts of strings®, tangles®, Zentangle®, and Zendalas®. The recommendation for further testing would be to test the Zendala’s® ability to reduce anxiety with a trained group of participants by a Certified Zentangle® Teacher (CZT), which are listed on [www.zentangle.com](http://www.zentangle.com).

Partly why this study asked participants about their academic major was to see if there were any conclusions to be gleaned from non-art familiar majors. Significant portions of the population were not art therapy or art-related majors, but the majority was still in the human services field of study. Conducting this same study, or a similar study, with non-human service majors may yield different results.

On a similar vein, conducting this study on a different population than college students may yield a more heterogeneous population and/or differing results than this study, Curry and Kasser (2005), and van der Venet and Serice (2012). Males, persons of non-Caucasian/White race/ethnicity, sexual orientation, and religious affiliations were not represented well, or at all in the case of sexual orientation and religious affiliation, by this study and offer a future researcher an explore-able option for populations for future mandala-related research studies to prove more a general applicability on whether mandalas help to reduce anxiety.

Furthermore, there may have been a critical flaw in the implementation of this study's design which may have hindered the study's results. This study randomly assigned participants into three groups, but all three different mandala types were being tested at the same time, contrary to van der Venet and Serice's (2012) study which tested each group separately. Participants were able to see other people's mandalas; this was especially evident in smaller participant groups since participants did not have the ability to sit further away from each other. Regardless of group size, the three groups most likely were influenced by each other, which in turn influenced the study's results. Ergo, the recommendation would be to separate any future multi-mandala format study's groups to prevent this possible issue.

### **Conclusions**

The results of this study do support the hypothesis ( $H_{a1}$ ) that both the pre-drawn mandalas and unstructured mandalas would yield similar results in anxiety reduction but does not support the hypothesis ( $H_{a2}$ ) that the pre-drawn and unstructured groups would have greater reductions in anxiety than the "Zendala"® group, according to the one-way and 2 X 3 ANOVAs' results. Although the 2 X 3 ANOVAs' results indicate that another variable, labeled in Table 7 as Time, was what decreased anxiety in participants from T2 to T3; although the 2 X 3 ANOVA supports that the pre-drawn mandala and unstructured mandala groups yield statistically similar results. No mandala group was successful at statistically reducing anxiety from T2-T3 when compared to each other, which is contrary to similar studies by Curry and Kasser's (2005) and van der Venet and Serice's (2012) results. Yet, the pre-drawn mandala and the unstructured mandala results did yield statistically similar results as determined by the one-way ANOVA and 2 X 3 ANOVA. The paired sample *t*-test support these two groups reduced anxiety from T2 to T3. The

writing exercise (T1-T2) produced statistically significant results for the pre-drawn and unstructured groups (Tables 2 and 3), allowing the rejection of ( $H_o$ B) for those groups. The “Zendala”® group did not respond to the writing exercise (T1-T2) or the “Zendala”® intervention (T2-T3). The paired sample *t*-test results seem to contradict the 2 X 3 ANOVA results for all three groups when looking at the effect of time; this leaves some room for doubt on whether the pre-drawn and unstructured mandalas may indeed be successful at reducing anxiety. However, *t*-tests are more prone to type I errors; there may be a type I error in this paired sample *t*-test. Regardless, both the paired sample *t*-tests and the 2 X 3 ANOVA indicate the “Zendala”® constructed mandala, as prepared for use with this study, was not useful in reducing anxiety. In conclusion, none of the mandala interventions were successful at statistically reducing anxiety when compared to each other. Yet, the pre-drawn and the unstructured mandala groups’ paired sample *t*-tests support that as interventions there is promise that they can successfully reduce anxiety from T2 to T3.



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**Appendix A: HSRC Approval Notice**

Nazareth College 4245 East Avenue Rochester, New York 14618-3790 585-389-2772 fax 585-389-2791 [www.naz.edu](http://www.naz.edu)

**APPROVAL NOTICE****INSTITUTIONAL REVIEW BOARD**

Academic Affairs

[HSRC@naz.edu](mailto:HSRC@naz.edu)

DATE: March 14, 2013

TO: Ms. Abby Mann

FROM: Dr. Shirley Sommers

Chairperson, Nazareth College Institutional Review Board

RE: HSRC #: FA2012-06

Title: *Pre-dawn Mandalas versus Constructed Mandalas versus Unstructured Mandalas: Which creates a greater reduction anxiety?*

**Approval Period** from 11/19/2012 through 11/19/2013

Please be notified that the Nazareth College Institutional Review Board has approved the above referenced research project involving human subjects in research. The protocol number for this research is HSRC #FA2012-06. The Nazareth College Federal Wide Assurance (FWA) with the Department of Health and Human Services, Office for Human Research Protection is FWA00013172.

It is your obligation as principal investigator to perform the project according to the approved protocol using the approved informed consent form. You may not implement changes in the approved protocol or consent form without prior Nazareth College IRB approval. You must promptly report all undesirable and unintended adverse reactions or events that are the result of therapy or other intervention within ten working days of occurrence.

This approval is for conduct of the study for the above stated time period. If the study will continue beyond that time, you must notify the IRB and obtain approval for continuation.

If your research is federally-supported the funding sources(s) for this project include the following:

PI of Contract/Grant:

Funding Source:

Contract/Grant No: Contract/Grant title:

SHIRLEY M. SOMMERS

Shirley Sommers, Ph. D.

Vice-Chairperson, Human Subjects Review Committee and Institutional Review Board

Nazareth College

585 389-2907

[ssommer4@naz.edu](mailto:ssommer4@naz.edu)

**Appendix B: Consent Form**

Code # \_\_\_\_\_



Nazareth College of Rochester  
Creative Arts Therapy Department  
Pre-Drawn/Constructed/Unstructured Mandalas  
Principal Investigator: Abigail E. Mann, Graduate Student  
Faculty Advisor: Dr. Renee van der Vennet, PhD, ATR-BC, LCAT, LMHC, CGP

**Introduction:**

This consent form describes a research study and what I may expect if I decide to participate. I will read this consent form carefully and to ask the researcher who presents it any further questions you may have before making your decision whether or not to participate. This study is being conducted by Abigail E. Mann, a graduate student of Nazareth College of Rochester, Creative Arts Therapy Department. Her faculty advisor is: Dr. Renee van der Vennet, PhD, ATR-BC, LCAT, LMHC, CGP.

**Purpose of Study:**

- 1) To further the research of Curry and Kasser's (2005) and van der Vennet and Serice's (2012) studies on the coloring of mandalas to increase reliability and validity of their work.
- 2) To add to the growing body of research Zentangle® designs, with permission from the authors- Maria Thomas and Rick Roberts (personal communication, September 6, 2012).

**Description of Study Procedures:**

If I decide to participate in this study I will be asked to complete a Consent Form, an Art Therapy Confidentiality Form, Demographic Questionnaire, three Inventories, a fourminute writing assignment, one of three different mandalas, and a debriefing handout. Overall, this study will take 1 hour of your time.

**Participation Criteria:**

As a participant, I attest that I am a currently enrolled undergraduate or graduate student of Nazareth College of Rochester, of the age of majority but less than age 65. I will be withdrawn from the study if it is indicated on the demographic form that I am not currently enrolled as a student of Nazareth College or am not within the age bracket of 18-65 years. I will also be excluded if I fail to complete the mandala, the three Inventories, or the other included forms.

**Risks of Participation**

The risks of participating in this study are minimal. There is a possibility that this study may induce uncomfortable emotions/emotional states and/or repressed memories during the four-minute writing exercise and/or any part of the study. The materials utilized

during this intervention are relatively harmless and non-toxic. The food provided is not vegetarian, not presumed to be gluten free, and not Kosher.

A debriefing session will be held for each individual who participates in this study. A licensed professional mental health provider will also be available should any participant need assistance. I will also be referred to the Nazareth Counseling Center should I need this assistance. If any problems arise as a result from this study, it may be recommended that I seek further professional help. If this occurs, the art therapy intern will contact her supervisor, Dr. Renee van der Vennet, and ensure that I am well cared for.

As in all research, I understand there may be unforeseen risks to myself. If an accidental injury occurs, appropriate emergency measures will be taken.

### **Benefits of Participation**

I will receive, if I so desire, a Pre-Packed Rice Krispie Treat® at the successful completion of the study. I can also elect to participate in a drawing for one of three local gift cards with the successful completion of the study. Abby Mann's advisor, Dr. van der Vennet will guarantee and monitor the awarding of the prizes.

### **Voluntary and Alternatives to Participation:**

I understand participation in this study is voluntary. I am free to not participate for any reason I find necessary, or withdraw at any time prior to the data collected by the study being incorporated into the researcher's collective thesis data. If I choose to withdraw from the study, my information will remain confidential and destroyed by the researcher. However, if the results have already been shared for research, publication, and educational presentations, my request cannot be retroactive.

### **Confidentiality**

I understand the results of my participation in this study will be reported in a published thesis and presentation. Although every method will be taken to ensure my confidentiality by never including names or identities of participants in reported data, *confidentiality cannot be guaranteed amongst the study group participants.*

In regards to my data collected, my name will not be used to label any of the materials collected for this study in order to ensure your confidentiality. All data gathered from me will be combined with the other data gathered and assigned an identification number. Data collected will be stored on a password protected computer hard drive, and a copy of the file will also be provided to the PI's advisor, Dr. van der Vennet, which will also be password protected. All physical copies of my data will be stored in a locked file cabinet inside Dr. Renee van der Vennet's office at Nazareth College for five years after the study is completed. The electronic file will be stored on the PI's laptop hard drive for five years after the study is completed. When five years has passed, my data will be deleted from the PI's laptop using advanced hard-drive wiping software. The DVD and the physical data kept by Dr. van der Vennet will be destroyed after five years.

### **Payments**

I will receive no direct monetary payment for my time and/or participation in the study. However, if I complete the study I will be offered a Pre-Packaged Rice Krispie Treat®



located in the back of the room on their way out, and I will also be offered the opportunity to enter into a drawing for one of three local gift certificates to venues within walking distance (up to 3 miles) from campus. My contact information will be retained for the purposes of this drawing only and will be destroyed via Nazareth College's confidential shredding services after its purpose has been served. I understand the random drawings will be held at the end of the study. The three winners will be contacted and provided 10 days to claim their prize. If I am chosen as a winner and I do not collect their prize after 10 days, I forfeit the prize. A new winner is randomly drawn and contacted until the prize is collected. Abby Mann's advisor, Dr. van der Vennet will guarantee and monitor the awarding of the prizes.

### **Contact Persons**

For more information concerning this research or if I feel that my participation has resulted in any emotional or physical discomfort I can contact:

- Abigail E. Mann, graduate student, 607-348-3648
- Dr. Renee van der Vennet, faculty advisor, at 585-389-2538
- The participant may also contact Dr. Connie Chau, PT, PhD, Chair of the Human Subjects Research Committee, Nazareth College, at 585-389-2907 if questions or problems arise during the course of the study.

### **Subject Consent**

I have read (or have had read to me) the contents of this consent form and have been encouraged to ask questions. I have received answers to my questions. I agree to participate in this study. I have received (or will receive) a signed copy of this form for my records and future reference.

Study Subject: \_\_\_\_\_ Print Name

Study Subject: \_\_\_\_\_ Signature

\_\_\_\_\_ Date

**Appendix C: Art Therapy Confidentiality Form**

Code # \_\_\_\_\_



Nazareth College of Rochester  
 Creative Arts Therapy Department  
Art Therapy Confidentiality Agreement

Research Participant's Name: \_\_\_\_\_

Date: \_\_\_\_\_

- I understand that by signing this document, I, \_\_\_\_\_, give my permission to Abigail Mann to do the following with my artwork (check all that apply):

- ☐ Photograph
- ☐ Duplicate
- ☐ Use the artwork in teaching, publication and educational presentation
- ☐ Use the artwork in research

- I understand that this agreement is valid for the following time period:
  - DATES: \_\_\_\_\_ (date the test is administered) through \_\_\_\_\_, 2018 (five years from the test date)
- I understand that all measures will be made to ensure that my identity will be protected and that any confidential material will remain confidential. I understand that if at any time that I chose to withdraw my permission, that I can do so by contacting Abigail Mann or Renee van der Vennet, PhD, ATR-BC, LCAT, LMHC, CGP and that my request will be taken care of immediately. \*\*
- I understand that if this work has been already shared for research, teaching, publication, and educational presentations that my withdrawal of permission cannot be retroactive.

Research Participant's

Signature: \_\_\_\_\_

Art Therapy Student Researcher's

Signature: \_\_\_\_\_

**\*\*The art therapist intern can be contacted through:**

**Dr. Renee van der Vennet, PhD, ATR-BC, LCAT,  
 LMHC, CGP  
 Nazareth College  
 4245 East Avenue, Rochester, N.Y. 14618**

**[rvander3@naz.edu](mailto:rvander3@naz.edu)  
 or (585) 389 2538**

**Abigail E. Mann, Graduate Art Therapy Student  
[amann4@mail.naz.edu](mailto:amann4@mail.naz.edu)**

**Nazareth College  
4245 East Avenue  
Rochester, N.Y. 14618**

**or 607-348-3648**

**Appendix D: Demographic Information****Code #:** \_\_\_\_\_**Age:** \_\_\_\_\_**Gender:** \_\_\_\_\_**Association with Nazareth College (Please circle one):**

Undergraduate Student

Graduate Student

Other

**What is your major? (Please write your major on the line below)**

\_\_\_\_\_

**Race/Ethnicity (Please circle one):**

Caucasian/White

Asian

Native Hawaiian/Pacific Islander

Black/African American

First Nation Member/Native American

Hispanic/Latino

Alaskan Native

Bi-Racial

Tri-Racial

Other: \_\_\_\_\_

**Appendix E: Permission from Maria Thomas and Rick Roberts**

Zentangle rickandmaria@zentangle.com

Sep 8 ★

to me ▾

On 9/6/12 2:38 PM, [amann4@mail.naz.edu](mailto:amann4@mail.naz.edu) wrote:**Contact Us Mail from Zentangle.com**

First Name :	Abigail "Abby"
Last Name :	Mann
Email Address :	<a href="mailto:amann4@mail.naz.edu">amann4@mail.naz.edu</a>
Comments :	I am preparing to conduct a research study for my Thesis at Nazareth College of Rochester, NY on Mandalas and (potentially) Zendalas and their capacity to reduce anxiety. I am asking for permission to use the concept of Zentangle and Zendala with proper citation. I am happy to provide more info.

Hi Abby,

Thanks so much for asking. Yes, you have our permission in that context. We are excited to see what you discover. If there is any info we can help you with, please let us know.

In case you did not see it, you may be interested in [this blog entry](#).

Thank you for your interest and your support.

Best,

Rick (and Maria)

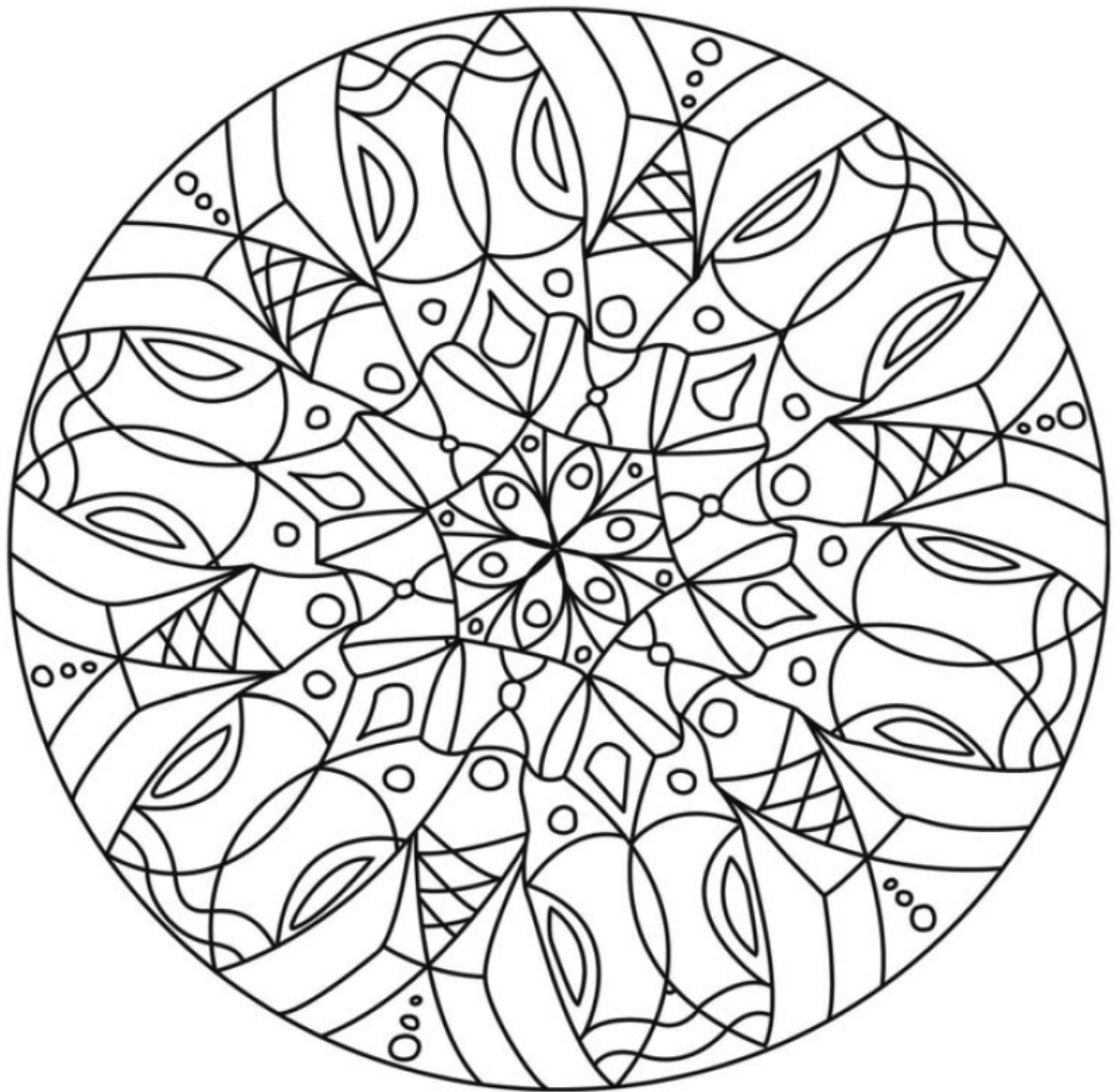
**Appendix F- Four-Minute Writing Assignment**

Think about a time when you felt the most fearful. Please write continuously for four minutes about that experience in your native language in the space provided below; you may use the back of this piece of paper if needed. The researcher will notify you when the four minutes are up.

**Appendix G: Mandala Pre-Drawn Pattern**

Code# \_\_\_\_\_

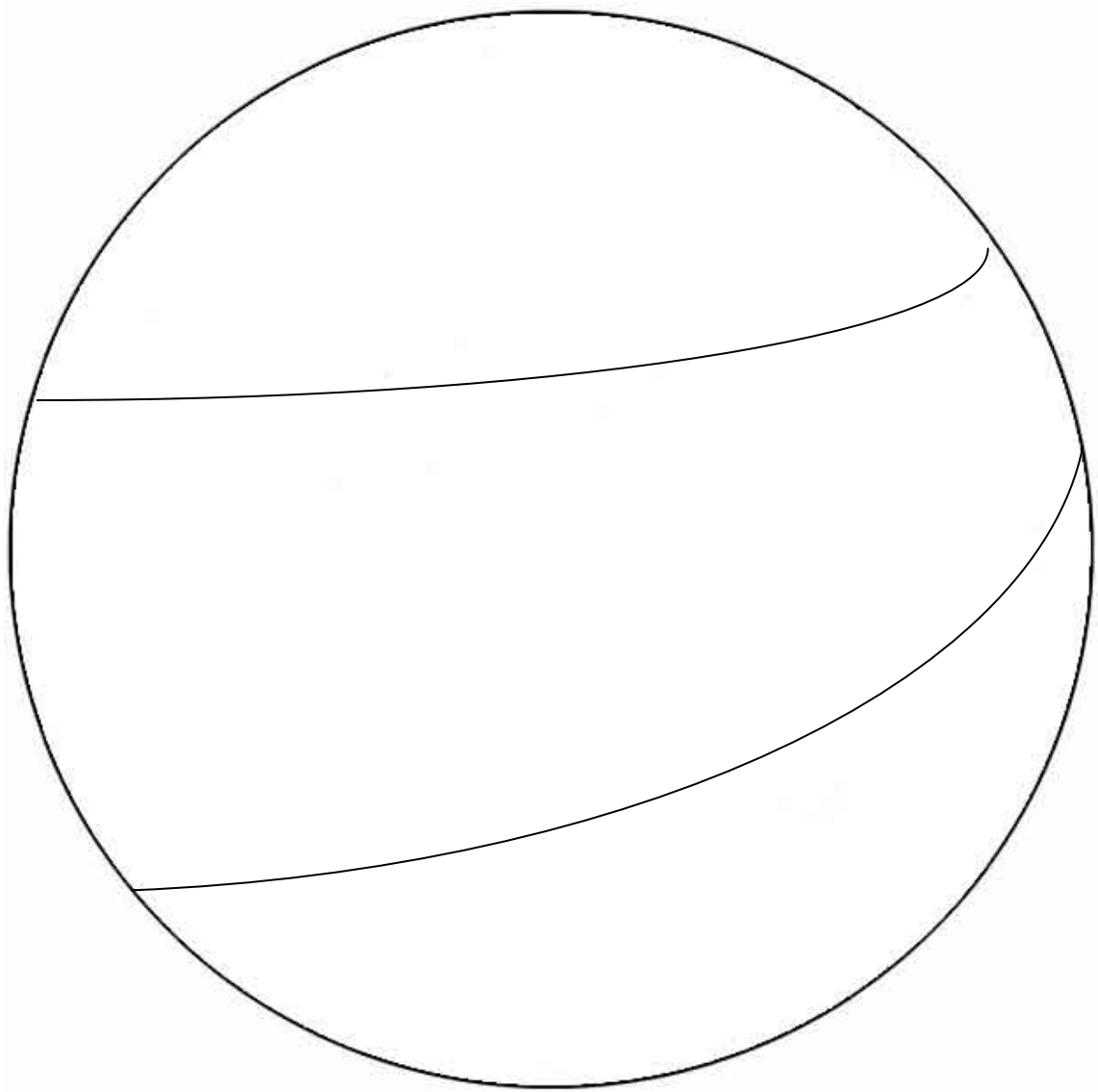
Directions: Please use the markers provided and completely color the circle any way you choose.  
*Your mandala does not need to conform to any coloring standards.*



**Appendix H: Mandala with a Zentangle® String Pattern**

Code # \_\_\_\_\_

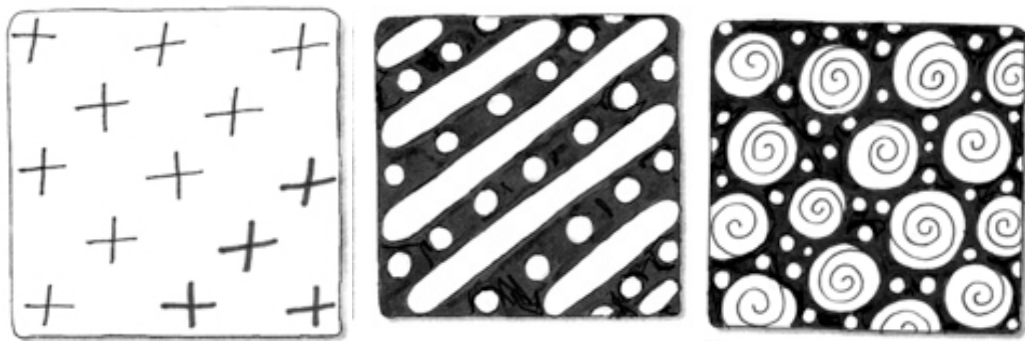
Directions: Please use the markers provided and completely fill the three sections with the Zentangle® patterns provided. Please use only 1 Zentangle® pattern per section of the circle. Repeat the Zentangle® pattern as much as you would like in each section. *Your Zentangle® patterns do not need to look exactly like the samples.*

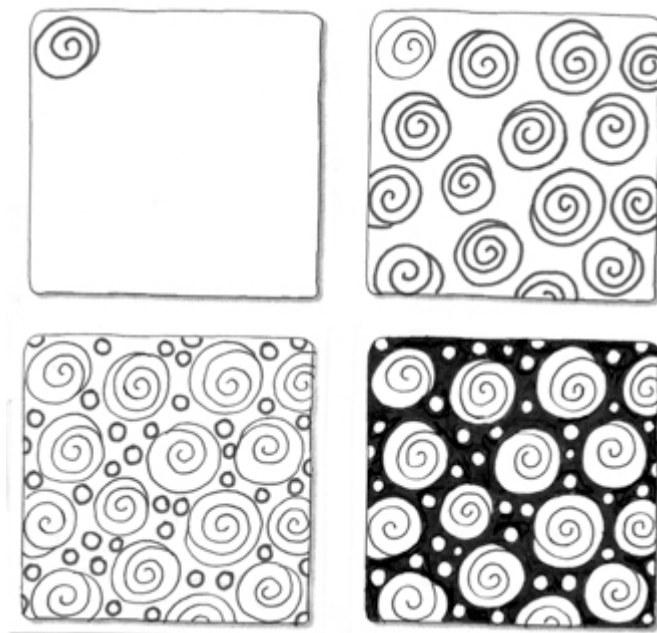




**Appendix I: Zentangle® Patterns for Use in the Mandala Instructions**

Instructions: Please use markers to create the following patterns in any order to fill each quadrant of the “Zendala”® provided (the circle with a shape in it). These patterns are meant to be repeated throughout each quadrant but you can decide how much to repeat them. As a note, the square box enclosing the pattern is not part of the pattern. Please fill each quadrant completely with one design. All designs must be used. These patterns do not need to be perfect replications. You can replicate the pattern by looking at the sample finished Zentangle® patterns provided below or by consulting the directions on the following pages. You can also consult your researcher for additional questions.

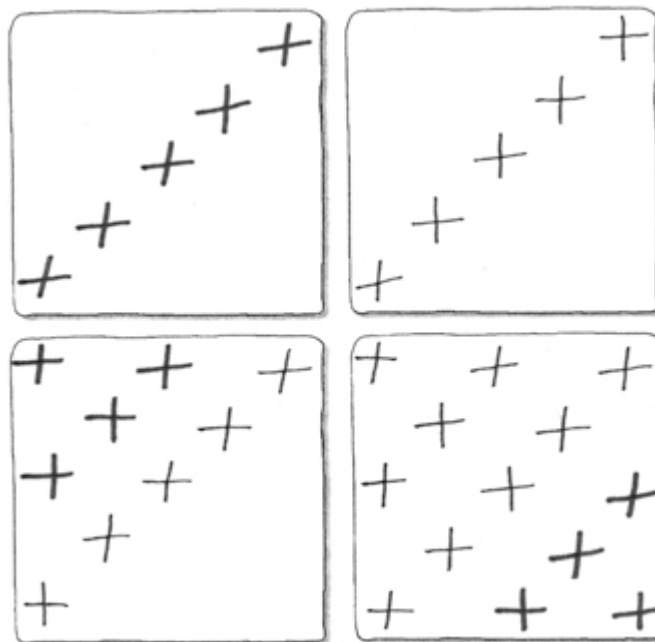


**Appendix J: Zentangle® Patterns Instructions Pattern: Printemps®**

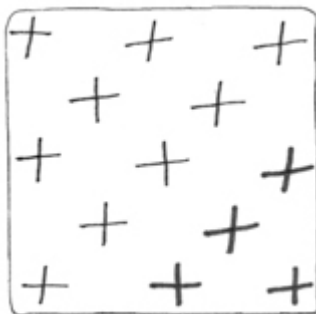
1. Draw a small spiral, sort of like a cinnamon bun or jelly roll. Start with a small “C” shape then spiral around it and close the end of the spiral.
2. Make more spirals to fill the section.
3. Add small circles to fill spaces in the section between the spirals.
4. Color the background.



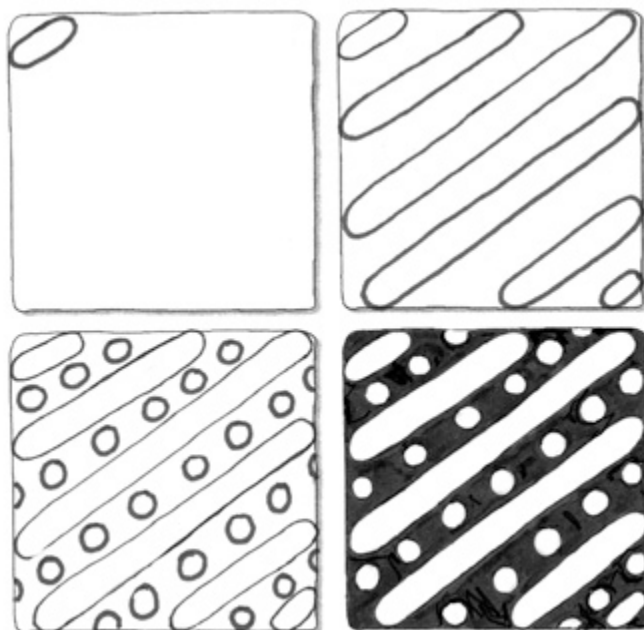
Finished Zentangle® Pattern: Printemps®

**Appendix J: Zentangle® Patterns Instructions Pattern: Cross Stitch®**

1. Draw a line of "X's" diagonally.
2. Add rows of diagonal X's on both sides of the original line of X's to fill the section.
3. Darken the X's if desired.



Finished Zentangle® Pattern: Cross Stitch®

**Appendix J: Zentangle® Patterns Instructions Pattern: Corn Rows®**

1. Draw a long oval shape.
2. Make diagonal rows of longer and shorter ovals.
3. Add circles in the space between the ovals.
4. Color the background.



Finished Zentangle® Pattern: Corn Rows®

**Appendix K: Debriefing Handout**

Nazareth College of Rochester  
Creative Arts Therapy Department

The main purpose of this study was to test whether a pre-drawn mandala shape, a constructed mandala shape-"Zendala"®, or an unstructured mandala would have a greater reduction in anxiety levels of Nazareth College of Rochester students (graduate and undergraduate) when students are exposed to anxiety through a four-minute writing exercise. The secondary purpose was to add to the growing body of research on the effects of constructed mandalas on mood using Zentangle® designs.

I would like to thank you for your participation in this study. If at anytime you experience any psychological or emotional discomfort as a result from your participation in this study, please contact my faculty advisor at Nazareth College, Dr. Renee van der Venet, at 585-389-2538 or myself, Abigail E. Mann, at 607-348-3648, and services will be made available to you. Please keep in mind that I am available to discuss or answer any questions or concerns with regards to your participation, in order to ensure that you are emotionally able to return to your normal daily activities. If, as a result of your participation, problems should arise at a later point, please use the appropriate contact information listed at the end of this form. Once again, I thank you for your participation.

**Abigail E. Mann, Graduate Art Therapy Student**  
Nazareth College  
4245 East Avenue  
Rochester, N.Y. 14618

[amann4@mail.naz.edu](mailto:amann4@mail.naz.edu)  
or (607) 348-3648

**Dr. Renee van der Venet, PhD, LCAT, LMHC, ATR-BC, CGP**  
Nazareth College  
4245 East Avenue, Rochester, N.Y. 14618

[rvander3@naz.edu](mailto:rvander3@naz.edu)  
or (585) 389-2538

**Nazareth College Counseling Center**  
Nazareth College-Student Wellness Center  
4245 East Avenue, Rochester, N.Y. 14618

[mkapadi1@naz.edu](mailto:mkapadi1@naz.edu)  
or (585) 389-2887

**Appendix L: Verbal Debriefing Procedure**

Nazareth College of Rochester  
Creative Arts Therapy Department

Before we continue, I need to reveal some information that was kept from you until this point in the study. The main purpose of this study was to test whether a pre-drawn mandala shape, a constructed mandala shape-"Zendala"®, or an unstructured mandala would have a greater reduction in anxiety levels of Nazareth College of Rochester students (graduate and undergraduate) when students are exposed to anxiety through a four-minute writing exercise. The secondary purpose was to add to the growing body of research on the effects of constructed mandalas on mood using Zentangle® designs.

At this point, the research session has come to a close. Before you leave, I would like to ask you a few questions:

1. Do you feel that your participation in this study has in any way caused you discomfort?
2. Do you feel that you are leaving this session feeling as you did upon arrival?
3. Do you have any emotions, thoughts, or concerns that you would like to discuss?
  - a. If yes, would you like to discuss this with me, the licensed professional mental health provider on call, or with one of the counselors at Nazareth College?
4. Do you feel that you are not comfortable enough to physically or emotionally return to your normal daily activities?
  - a. If yes, would you like to continue engaging in art therapy or choose another activity to help you become comfortable?

If you do not feel comfortable responding to these questions currently, please feel free to see me after the study has concluded.

I would like to thank you for your participation in this study. If at anytime you experience psychological or emotional discomfort as a result of your participation in this study, please feel free to contact my faculty advisor at Nazareth College, Dr. Renee van der Vennet, at 585-389-2538 or myself, Abigail E. Mann, at 607-348-3648, and services will be made available to you.



## Appendix N: Flyer

# Get food and a chance to win prizes for helping to color a Mandala for research!



Chance to win a gift certificate to one of the following:



Yotality



•Are you between the ages of 18-65 years old?

•Are you a undergraduate or graduate student of Nazareth College?

•Have an hour to kill?

**What do you get?** After completing this study you will get a **Pre-Packed Rice Krispie Treat®**, and you get a chance to win gift certificates to local businesses within walking distance from campus.



*No Previous Art Experience Required*

**For More Information and to Schedule a Time: Contact:**

**Abby Mann,  
Art Therapy Graduate  
Student Researcher  
607-348-3648**

**amann4@mail.naz.edu**

Mandala Research Study  
Contact: Abby Mann  
607-348-3648 (text friendly)  
amann4@mail.naz.edu

Mandala Research Study  
Contact: Abby Mann  
607-348-3648 (text friendly)  
amann4@mail.naz.edu

Mandala Research Study  
Contact: Abby Mann  
607-348-3648 (text friendly)  
amann4@mail.naz.edu

Mandala Research Study  
Contact: Abby Mann  
607-348-3648 (text friendly)  
amann4@mail.naz.edu

Mandala Research Study  
Contact: Abby Mann  
607-348-3648 (text friendly)  
amann4@mail.naz.edu

Mandala Research Study  
Contact: Abby Mann  
607-348-3648 (text friendly)  
amann4@mail.naz.edu

Mandala Research Study  
Contact: Abby Mann  
607-348-3648 (text friendly)  
amann4@mail.naz.edu

Mandala Research Study  
Contact: Abby Mann  
607-348-3648 (text friendly)  
amann4@mail.naz.edu

Mandala Research Study  
Contact: Abby Mann  
607-348-3648 (text friendly)  
amann4@mail.naz.edu



**Appendix O: Instructions for Study**

Thank you so much for your time this (morning/afternoon/evening). I ask that you set your cell phones and other electronic devices to silent for the duration of this study. This will take approximately one hour to complete.

I am conducting a study on coloring different kinds of mandalas. Therefore please do not be alarmed if your packet is a little different from others and do not share your packet with others around you. We will continue through the study as a group.

Please open your manila folder to Appendix B and begin filling out the form using the pen provided in the plastic bag. When finished I ask that you place your pens down so I know you are finished. We will not continue without all the other participants present.

(when everyone is finished) Please turn to the next page and begin filling out Appendix (insert letter). Again, when finished please place your pens down. (repeat until Appendix D is finished)

Please fill out the questionnaire on the next page; please fill this out to the best of your ability. There are no right or wrong answers. We will continue when everyone is finished.

(when everyone is finished) Please turn to the next page and think about a time when you felt the most fearful. Please write continuously for four minutes about that experience in your native language in the space provided below; you may use the back of this piece of paper if needed. I will notify you when the four minutes are up. Please begin now.

(when four minutes has elapsed) Please stop writing and turn to the next page. Please fill out the questionnaire on the next page; please fill this out to the best of your ability. There are no right or wrong answers. We will continue when everyone is finished.

(when everyone is finished) Please place your pens down and open your marker bag. Now please turn to the next page and carefully follow the directions to begin coloring your mandala. Please color the mandala in completely. You have 20 minutes to complete your mandala. I will inform you when 5 minutes remain and again when 2 minutes remain. If you would like me to read your directions out-loud just let me know. Also if you finish early, please wait quietly for everyone to finish. Please begin.

(when 20 minutes are up) Please place your marker down. This concludes the coloring session of the study. Please pick up your pen and turn to the next page. Please complete the questionnaire one last time.

(when everyone is finished read off of the Appendix L for the verbal debriefing)  
Please feel free to take the final page of the packet, Appendix K, with you. This is a written format of what I have just read to you.

This concludes the study. Please let me thank you again for your participation. In the back of the room you will find Pre-Packed Rice Krispie Treats®. Please feel free to take one piece. You can also enter into a drawing for one of three local gift certificates. Winners will be called after the study concludes, and if the winner cannot be reached within 10 days a new winner will be drawn and contacted. If you have any questions at any time, please feel free to contact me. Have a great (day/evening)!

**Appendix P: Initial Contact Script**

Thank you for expressing interest in my research study on mandalas. In case you're curious, a mandala is a type of circle that utilizes patterns inside the circle shape. To explain more about my study, I will be furthering Curry and Kasser's (2005) and van der Venet and Serice's (2012) studies; these studies involve coloring mandalas. You will be a participant in my research study, and therefore additionally you will be asked to fill out some paperwork before and after your mandala coloring experience. There will also be a four-minute writing exercise. This study should take roughly 1 hour of your time to complete.

As an advance note, we will be attempting to complete this study together. Come prepared with quiet reading materials or activities to do in case you finish early. However, if you cannot/do not wish to stay the full length of the study, you can leave at any time during the study without penalty or prejudice.

After completion of the study, please feel free to take a Pre-Packed Rice Krispie Treat®, and you are also able to enter into a drawing for one of three local gift certificates to venues within walking distance (up to 3 miles) from campus. The prizes will be given out after the study is over.

This study will be conducted in a small group format with up to 15 persons. You will not be working together. Below you will find a list of the scheduled group times, and feel free to choose more than one time that works well for you. I will respond within 3 business days to let you know which group I placed you in. If none of these times work well for you, please feel free to provide me with a time, and I will do my best to create a group to accommodate your schedule. My advisor, Dr. van der Venet will guarantee and monitor the awarding of the prizes.

Thank you, and if you have additional questions feel free to contact me at any point in this process.

Sincerely,

Abigail Mann

Group Times and Location:

**Appendix Q: Unstructured Mandala**

Directions: Please use the markers provided and completely fill the circle shape in any way you choose. *Your mandala does not need to conform to any coloring standards.*

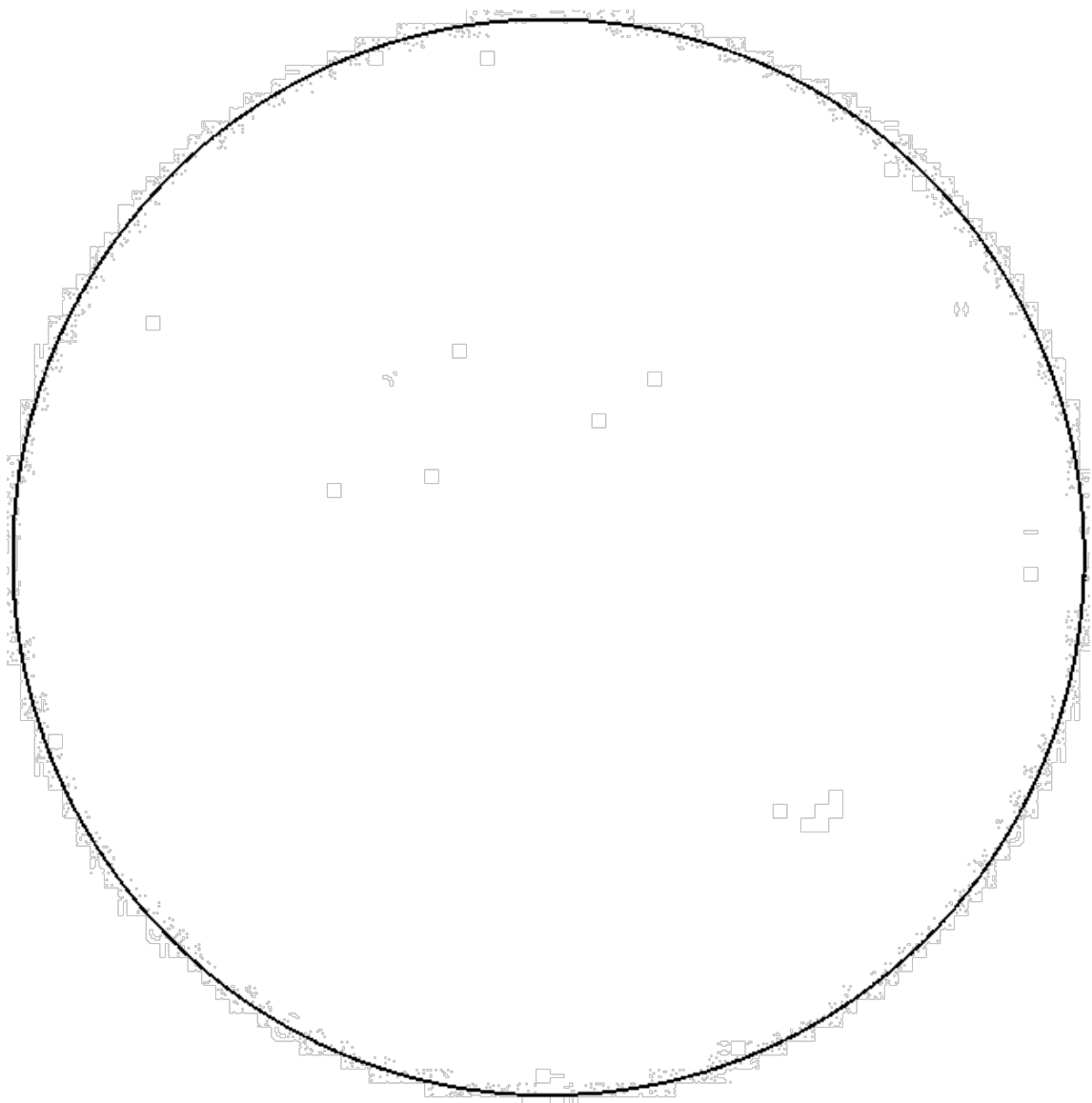


Table 1

*Demographic Data in Frequency (N) and Percent (%) for the Total Population, the Unstructured Mandala Group, the Pre-Drawn Mandala Group, and the “Zendala”® Mandala Group*

	Total Population (N = 42)		Unstructured Mandala Group (n = 14)		Pre-Drawn Mandala Group (n = 15)		“Zendala”® Mandala Group (n = 13)	
Category	N	%	N	%	N	%	N	%
Gender								
Female	35	83.3	13	92.9	13	86.7	9	69.2
Male	6	14.3	1	7.1	2	13.3	3	23.1
Other	1	2.4	0	0	0	0	1	7.7
Association with Nazareth College								
Undergraduate	19	45.2	7	50	6	40	6	46.2
Graduate	23	54.8	7	50	9	60	7	53.8
Academic Major								
Social Work	11	26.2	3	21.4	3	20	4	30.8
Art Therapy	11	26.2	4	28.6	5	33.3	3	23.1
Music Therapy	6	14.3	0	0	3	20	3	23.1
Creative Arts Therapy	6	14.3	3	21.4	3	20	0	0
Other	8	19.2	4	28.6	1	6.7	3	23.1
Race/Ethnicity								
Caucasian/White	30	71.4	10	71.4	11	73.3	9	69.2
Asian	2	4.8	1	7.1	1	6.7	0	0
African American/Black	4	9.5	2	14.3	0	0	2	15.4
First Nation	1	2.4	0	0	1	6.7	0	0
Hispanic	4	9.5	1	7.1	2	13.3	1	7.7
Bi-Racial	1	2.4	0	0	0	0	1	7.7
Age (Years)								
Mean	25.8		23		24.9		29.7	
SD	8.2		5.9		7.5		10.0	
Range	30 (18-48)		23 (18-41)		29 (19-48)		29 (19-48)	

Table 2

*Descriptive Statistics (Mean and Standard Deviation) of SAI Anxiety Levels at T1, T2, and T3 and Changes from T3-T2 for the Total Population, the Unstructured Mandala Group, the Pre-Drawn Mandala Group, and the “Zendala”® Mandala Group*

Group	N	T1			T2		T3		T3-T2	
		M	SD		M	SD	M	SD	M	SD
Unstructured	14	35.5	7.1		44.6	11.9	32.6	9.7	-11.9	13.2
Pre-Drawn	15	36.1	10.0		46.7	11.5	36.4	9.8	-10.3	13.5
“Zendala”®	13	34.5	11.3		37.9	11.8	35.5	11.1	-2.4	14.7
Total (Average)	42	35.4	9.4		43.3	12.0	34.9	10.0	-8.4	14.1

*Note: N = frequency; M = mean; SD = standard deviation*

Table 3

*Paired Sample t-Tests to Compare the Change in Anxiety Levels Based on SAI Scores at Various Times (T1, T2, and T3) for the Unstructured Mandala Group, the Pre-Drawn Mandala Group, and the “Zendala”® Mandala Group*

	t	df	p	95% CI	
				LL	UL
Unstructured					
T1-T2	-4.96	13	.000*	-13.0	-5.1
T2-T3	3.38	13	.005*	4.3	19.5
T1-T3	1.09	13	.294	-2.8	8.5
Pre-Drawn					
T1-T2	-4.68	14	.000*	-15.46	-5.74
T2-T3	2.97	14	.010*	2.88	17.79
T1-T3	-0.09	14	.926	-6.33	5.79
“Zendala”®					
T1-T2	-1.58	12	.139	-8.04	1.27
T2-T3	0.58	12	.570	-6.52	11.29
T1-T3	-0.23	12	.826	-10.67	8.67

*Note: CI = confidence interval; t = test statistic; df = degrees of freedom; LL = lower limit; UL = upper limit, \*p < .05, two-tailed*

Table 4

*Descriptive Statistics (Mean and Standard Deviation) of Delta ( $\Delta$ ) SAI Anxiety Levels at T1-T3, T1-T2, and T2-T3 for the Unstructured Mandala Group, the Pre-Drawn Mandala Group, and the “Zendala”® Mandala Group*

	Unstructured		Pre-Drawn		“Zendala”®	
	M	SD	M	SD	M	SD
$\Delta$ T3-T1	-2.86	9.77	0.27	10.94	1.00	16.01
$\Delta$ T2-T1	9.07	6.84	10.60	8.77	3.38	7.71
$\Delta$ T3-T2	-11.93	13.19	-10.33	13.46	-2.38	14.74

*Note: M = mean; SD = standard deviation*

Table 5

*Independent Sample t-Tests to Compare the Amount of Change Based on Delta ( $\Delta$ ) SAI Anxiety Levels at T1-T3, T1-T2, and T2-T3 between the Unstructured Mandala Group, the Pre-Drawn Mandala Group, and the “Zendala”® Mandala Group*

	t	df	p	Mean Difference	Std. Error Difference	95% CI	
						LL	UL
Unstructured and Pre-Drawn							
$\Delta$ T3-T1	-0.81	27	.426	-3.12	3.86	-11.05	4.80
$\Delta$ T2-T1	-0.52	27	.607	-1.53	2.94	-7.55	4.50
$\Delta$ T3-T2	-0.32	27	0.75	-1.60	4.95	-11.76	8.57
Unstructured and “Zendala”®							
$\Delta$ T3-T1	-0.76	25	.453	-3.86	5.06	-14.28	6.57
$\Delta$ T2-T1	2.03	25	.053*	5.69	2.80	-0.08	11.46
$\Delta$ T3-T2	-1.78	25	.088	-9.54	5.37	-20.61	1.53
Pre-Drawn and “Zendala”®							
$\Delta$ T3-T1	-0.14	26	.887	-0.73	5.12	-11.26	9.80
$\Delta$ T2-T1	2.29	26	0.03*	7.22	3.14	0.75	13.68
$\Delta$ T3-T2	-1.49	26	0.15	-7.95	5.33	-18.90	3.01

*Note: CI = confidence level; t = test statistic; df = degrees of freedom; LL = lower limit; UL = upper limit, \*p < .05, two-tailed*



Table 6

*One-way ANOVA to Compare the Overall Change in Anxiety Levels from T2-T3 Based on  $\Delta$ SAI Scores of the Unstructured Mandala Group, the Pre-Drawn Mandala Group, and the “Zendala”<sup>®</sup> Mandala Group*

	Sum of Squares	df	Mean Square	F	p
$\Delta$ T2-T3	700.78	2	350.39	1.85	.171

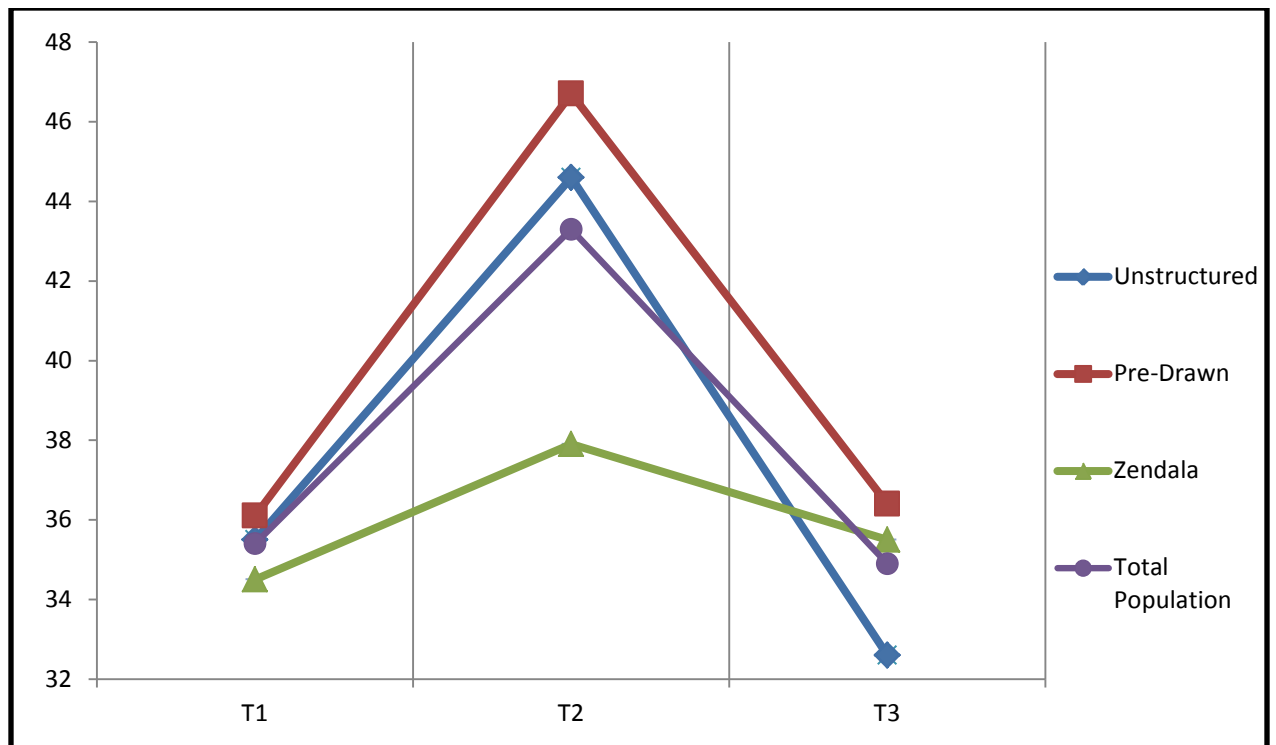
*Note: df = degrees of freedom; F=F-test, \*p < .05, two-tailed*

Table 7

*2x3 ANOVAs to Compare the Anxiety Levels from SAI Scores (T2-T3) and How They Were Influenced by Either Time and/or the Unstructured Mandala Group, the Pre-Drawn Mandala Group, and the “Zendala”® Mandala Group*

	Type III Sum of Squares	df	Mean Square	F	p
SAI					
Time	1412.56	1	1412.56	14.88	.000*
Group x	350.39	2	175.20	1.85	.171
Time					
Group	344.77	2	172.39	1.19	.317

*Note: df = degrees of freedom; F=F-test, \*p < .05, two-tailed*



*Figure 1: Mean SAI Scores of the Unstructured, Pre-Drawn, and “Zendala”® Mandala Intervention Groups*



*Figure 2:* Example of an Unstructured Mandala



*Figure 3: Example of a Pre-Drawn Mandala*



*Figure 4:* Example of a “Zendala”® Mandala